DMA-1000 Series

Digital Media Adapter

User's Guide

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ZyXEL

www.zyxel.com

About This User's Guide

Intended Audience

This manual is intended for people who want to use and configure the DMA-1000 or DMA-1000W. You should have at least basic computer usage knowledge.

Related Documentation

- Quick Start Guide

  The Quick Start Guide is designed to help you get up and running right away. It contains information on setting up your network and configuring for Internet access.
- Supporting Disk

  Refer to the included CD for software and support documents.
- ZyXEL Web Site

  Please refer to www.zyxel.com for additional support documentation and product certifications.

User Guide Feedback

Help us help you. Send all User Guide-related comments, questions or suggestions for improvement to the following address, or use e-mail instead. Thank you!

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Document Conventions

Warnings and Notes

These are how warnings and notes are shown in this User's Guide.

> Warnings tell you about things that could harm you or your device.

> Notes tell you other important information (for example, other things you may need to configure or helpful tips) or recommendations.

Syntax Conventions

- Both the DMA-1000 and DMA-1000W may be referred to as the "DMA", the "device", the "system" or the "product" in this User's Guide. Distinctions are made were needed.
- Product labels, screen names, field labels and field choices are all in **bold** font.
- A key stroke is denoted by square brackets and uppercase text, for example, [ENTER] means the "enter" or "return" key on your keyboard.
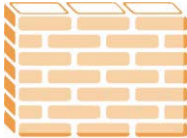- "Enter" means for you to type one or more characters and then press the [ENTER] key. "Select" or "choose" means for you to use one of the predefined choices.
- A right angle bracket (>) within a screen name denotes a mouse click. For example, **Maintenance > Log > Log Setting** means you first click **Maintenance** in the navigation panel, then the **Log** sub menu and finally the **Log Setting** tab to get to that screen.
- Units of measurement may denote the "metric" value or the "scientific" value. For example, "k" for kilo may denote "1000" or "1024", "M" for mega may denote "1000000" or "1048576" and so on.

Icons Used in Figures

Figures in this User's Guide may use the following generic icons. The DMA icon is not an exact representation of your device.

DMA	DMA with Remote Control	Notebook computer
Computer	Television (TV)	USB Memory Stick
Server	Firewall	Switch
Router		

Safety Warnings

For your safety, be sure to read and follow all warning notices and instructions.

- Do NOT use this product near water, for example, in a wet basement or near a swimming pool.
- Do NOT expose your device to dampness, dust or corrosive liquids.
- Do NOT store things on the device.
- Do NOT install, use, or service this device during a thunderstorm. There is a remote risk of electric shock from lightning.
- Connect ONLY suitable accessories to the device.
- Do NOT open the device or unit. Opening or removing covers can expose you to dangerous high voltage points or other risks. ONLY qualified service personnel should service or disassemble this device. Please contact your vendor for further information.
- Make sure to connect the cables to the correct ports.
- Place connecting cables carefully so that no one will step on them or stumble over them.
- Always disconnect all cables from this device before servicing or disassembling.
- Use ONLY an appropriate power adaptor or cord for your device. Connect it to the right supply voltage (for example, 110V AC in North America or 230V AC in Europe).
- Do NOT allow anything to rest on the power adaptor or cord and do NOT place the product where anyone can walk on the power adaptor or cord.
- Do NOT use the device if the power adaptor or cord is damaged as it might cause electrocution.
- If the power adaptor or cord is damaged, remove it from the device and the power source.
- Do NOT attempt to repair the power adaptor or cord. Contact your local vendor to order a new one.
- Do not use the device outside, and make sure all the connections are indoors. There is a remote risk of electric shock from lightning.
- Do NOT obstruct the device ventilation slots, as insufficient airflow may harm your device.
- If you wall mount your device, make sure that no electrical lines, gas or water pipes will be damaged.

This product is recyclable. Dispose of it properly.

Contents Overview

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Introducing the DMA

This chapter introduces the main applications and features of the DMA. See the Quick Start Guide for instructions on connecting the DMA.

1.1 Overview

The DMA plays digital audio, video and photo files on your television (instead of your computer monitor). The DMA has an HDMI (High Definition Multimedia Interface) for high quality digital video and audio output. The remote control lets you easily browse and play your digital content files and configure the DMA's settings: all on your television screen.

1.1.1 Play Files on USB

The DMA plays media files stored on a USB device like a memory stick or hard drive.

Figure 1   DMA with USB
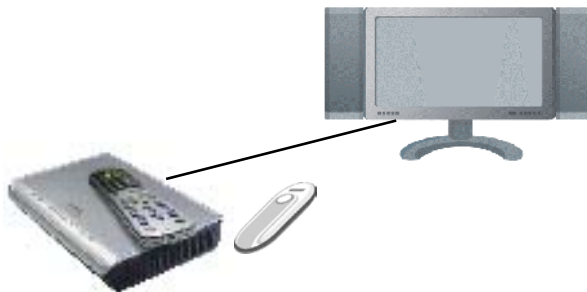
1.1.2 Play Files on Media Servers

The DMA plays media files stored on your media servers. See the Quick Start Guide to install the included media server software on your Windows XP computers to use them as media servers. The NSA-220 network storage appliance is also a media server.

The DMA connects to your media servers through an Ethernet connection. The DMA-1000W also allows you to connect to a IEEE 802.11b/g compliant wireless LAN network. It can connect to an Access Point (AP) or another IEEE 802.11b/g compliant wireless LAN client.

Here, the DMA lets the TV play files stored on computers **A** and **B** and an NSA-220.

Figure 2   DMA with Media Servers
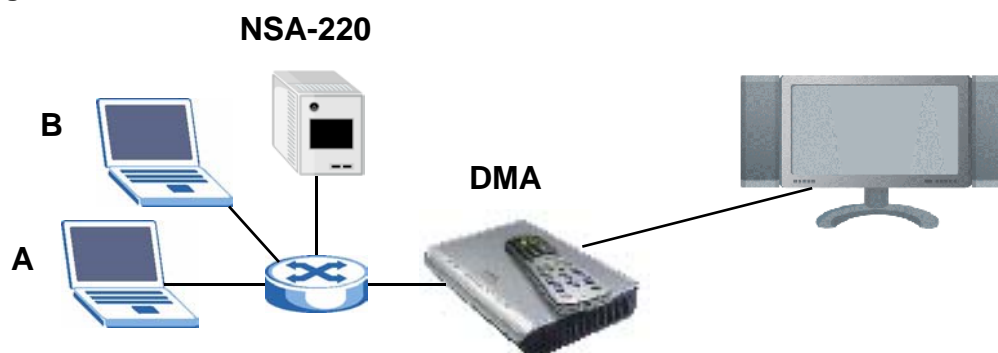
1.1.3 Play Podcasts

The DMA can play podcast audio files. Podcasting is a way of publishing audio files through the Internet using feeds. You can play the content on your computer or a mobile device (like an MP3 player). Place the DMA behind a firewall and/or IDP (Intrusion Detection and Prevention) device to protect it from attacks from the Internet.

Figure 3   Podcasts
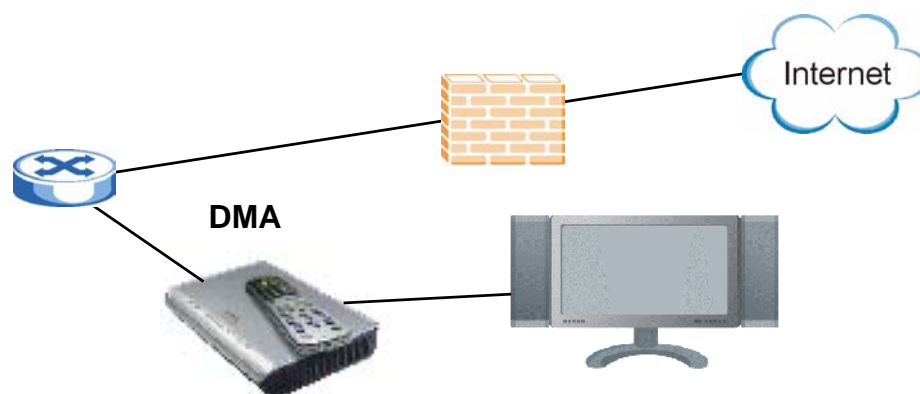
1.2 LEDs

The LEDs (lights) tell you about the current status of the DMA.

Figure 4   LEDs

The following table describes the DMA LEDs.

Table 1 LEDs

LED	COLOR	STATUS	DESCRIPTION
STATUS	Orange	On	The DMA is receiving power and in operation mode (on).
	Green	On	The DMA is receiving power and in standby mode (off).
		Off	The DMA is not receiving power.
PLAY	Green	Blinking	The DMA is playing a file.
		Off	The DMA is not playing a file.
LAN	Green	On	The DMA has a successful Ethernet connection.
		Blinking	The DMA is sending/receiving data on this port.
		Off	The DMA does not have a connection on this port.
WLAN (DMA-1000W only)	Green	On	The DMA has a successful wireless LAN connection.
		Blinking	The DMA is sending/receiving data through the wireless LAN connection.
		Off	The DMA does not have a wireless LAN connection.
USB	Green	On	The DMA has a USB stick (or hard drive) connected.
		Off	The DMA does not have a USB stick connected.

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Using the Remote Control

This chapter describes how to use the remote control to configure and use the DMA.

2.1 Using the Remote Control

Use the remote control to navigate the menus, play files and configure the DMA. The following figure describes the function of each button on the remote control.

Point the remote control at the front of the DMA.

Figure 5   Remote Control

Power turns the DMA off and on.

Use the 0~9, **CLEAR** and **INPUT** buttons to input numbers (like for individual scenes or times).

PAGE up/down scroll up or down a list to the previous or next page.

AUDIO switches audio output between left, right and stereo speakers.

A-B lets you select start and stop times to repeat an interval.
REPEAT keeps playing (loops) the file.
INFO displays details about the playing file.

SERVER opens a menu where you select a media server.
ROTATE turns a photo 90° clockwise.
SHUFFLE plays your playlist (favorites) files in random order.
OPTION opens the menu where you configure the DMA's settings.

HOME return to the main menu.

MUTE turns off the sound.
VOLUME up/down adjust the volume.

Use the **OK**, **BACK** and arrow buttons to go through the menus and play your files. When configuring, use the arrow and **OK** buttons to select a field. Then use the arrow and **OK** buttons to select an option.
TOOL opens the **TOOL** menu for additional options.

These buttons perform the previous, play, next, reverse, stop, fast forward, skip, pause and slow motion functions during file playback.

PHOTO opens a menu of picture files to view.
VIDEO opens a menu of video files to play.
MUSIC opens a menu of music files to play.
USB opens a menu of files on your USB device.
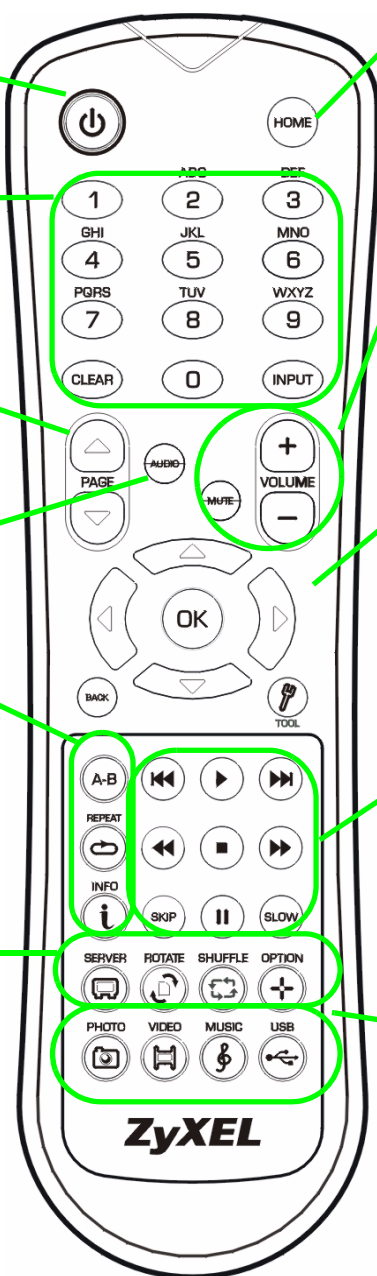
✎ You cannot use the **SERVER**, **OPTION**, **PHOTO**, **MUSIC** or **VIDEO** buttons while a dialog box, popup screen or TOOL menu is displayed.

DMA Menus

This chapter introduces the DMA's menus and how to navigate them.

3.1 Menus Overview

The DMA uses menus that display on your television screen. The **HOME** menu is the first menu you see when you turn on the DMA.

Figure 6   HOME Menu
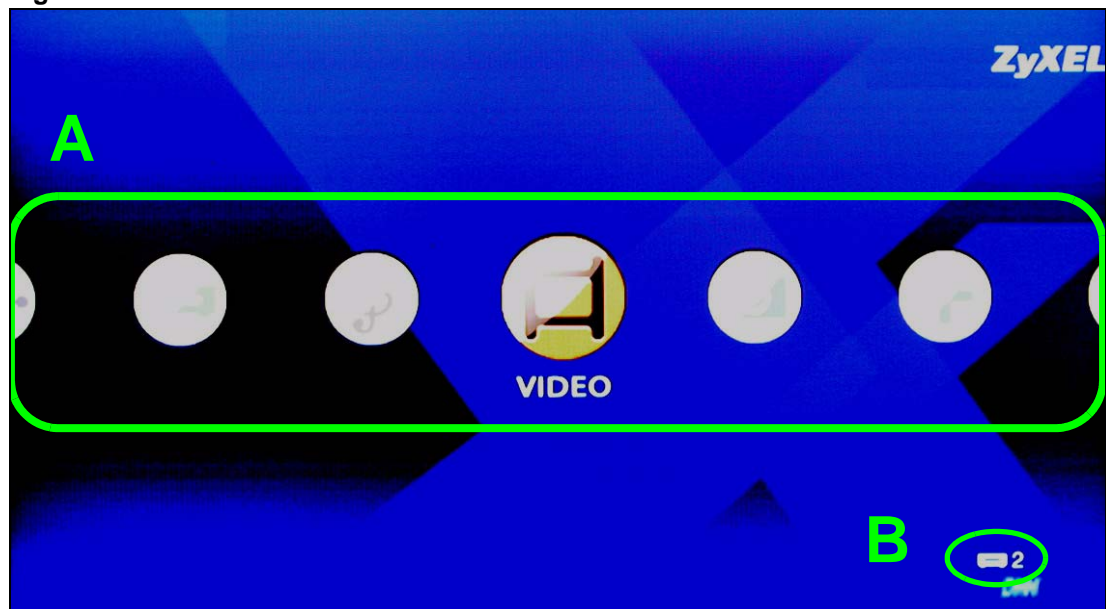
This table describes the **HOME** menu.

Table 2   HOME Menu

AREA	DESCRIPTION
A	Select the menu that you want to use (Table 3 on page 28 lists the main menus).
B	This is the number of media servers the DMA has detected. If it is two or more, use the **SERVER** menu to select the one you want to use. See Section on page 39 for details.

3.2 Menu Navigation

Use the remote control's **OK, BACK** and arrow buttons to go through the menus, configure the DMA and play your files.

> ✎ Use the remote control's arrow and **OK** buttons to select fields and field options.

3.3 Menus Summary

These are the DMA's main menus.

Table 3   Menus Summary

MENU	DESCRIPTION
SERVER	Select a media server with content files that you want to play. See Chapter 5 on page 39 for details.
MUSIC	Contains music files on the media server you are accessing. Music files on a USB stick that you add to a favorites folder also display here. See
VIDEO	Contains video files on the media server you are accessing. Video files on a USB stick that you add to a favorites folder also display here.
PHOTO	Contains photos on the media server you are accessing. Photos on a USB stick that you add to a favorites folder also display here.
OPTION	Use this menu to configure the DMA.
USB	Contains the files on an attached USB device.

3.4 Menu Description

Here are some general menu screen descriptions. The main **VIDEO** menu is shown here as an example. Other menus work in a similar way.

Figure 7   Main Menu Description
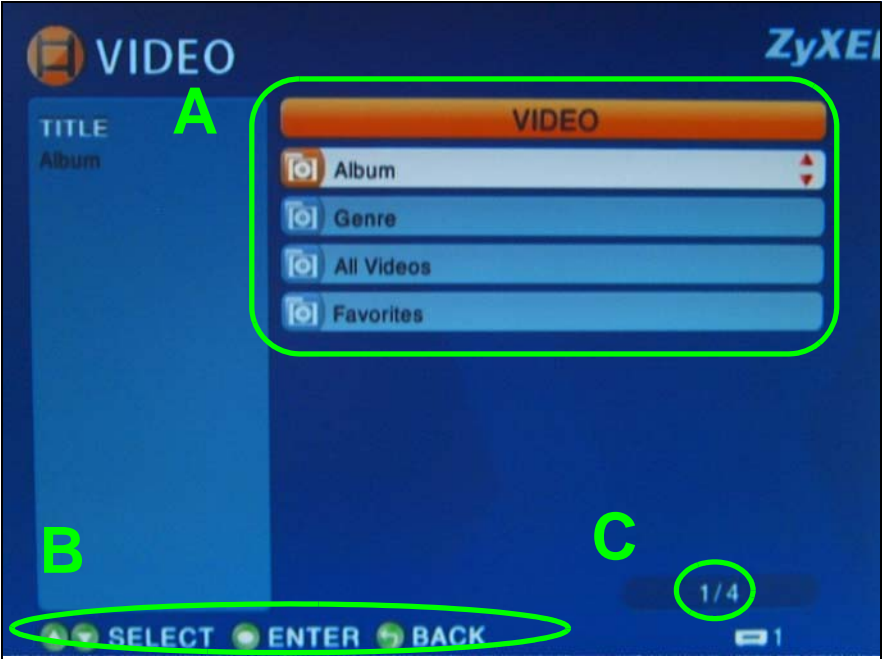
This table describes the main **VIDEO** menu.

Table 4   Main Menu Description

AREA	DESCRIPTION
A	List of the file folders. The currently selected item is white. The arrows show that you can move up or down in the menu.
	The DMA categorizes files into album, artist and genre folders according to the information stored in your files. Files may not appear in the proper folders if they have missing, incorrect or incomplete information.
	Album - Search for videos, music or photos by album.
	Artist - Search for music by artist.
	Genre - Search for videos or music by album.
	All Music / **All Videos** / **All Photos** - All of the menu's files display here.
	Favorites - Contains folders of the files you have marked as favorites. You can use a favorites folder to have the DMA play the entire list of files (this is also known as a playlist).
B	This shows which remote control buttons to use in the menu. For example, in this menu, use the remote control's arrow and **OK** buttons to select a folder to see the files sorted by that criteria. Or use the **BACK** button to go up in the menu structure (return to the **HOME** screen).
C	This displays the number of the selected menu item followed by the total number of items. In this example menu, the first of four items is selected.

3.4.1 File Folder Menu Description

This section describes an folder menu of videos, music or photos. The **VIDEO > All Videos** menu is shown as an example. The **MUSIC** and **PHOTO** menu file folders work the same way.

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Figure 8   File Folder Menu Description
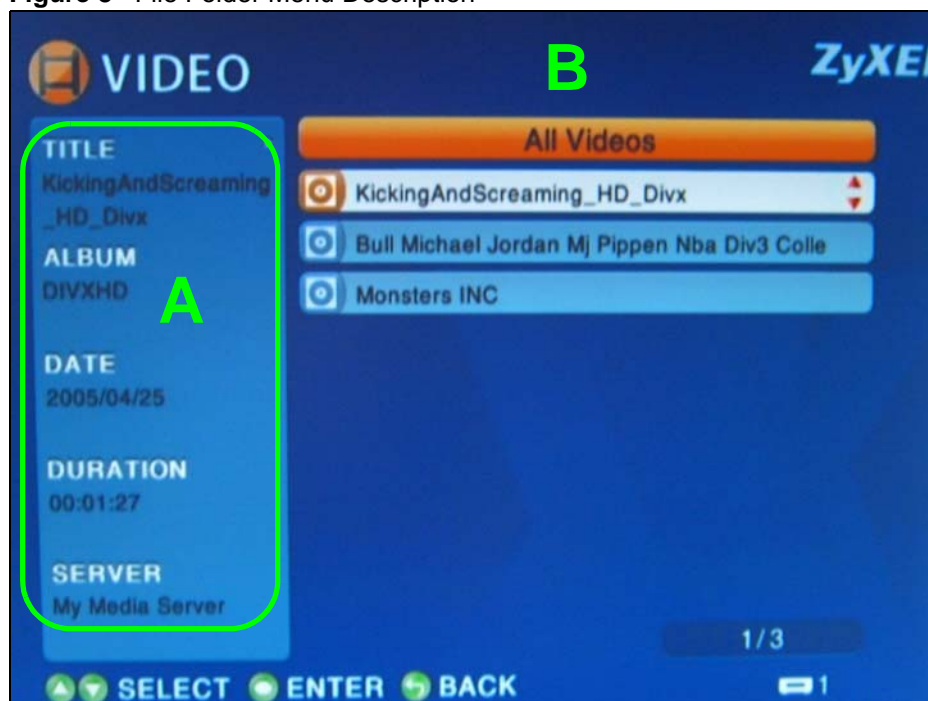
This table describes the main VIDEO menu.

Table 5   File Folder Menu Description

AREA	DESCRIPTION
A	Details about the currently selected file. **TITLE** - The name of the file. **ALBUM** - Which album the file belongs to. **DATE** - The date the file was created (or last modified). **DURATION** - The play time of the file in hours:minutes:seconds. **SERVER** - The name of the media server where the file is located.
B	Select a file and press the remote control's **TOOL** button to add it to a favorites folder (see Section 3.4.2 on page 30).

3.4.2 Using the TOOL Menu From a File Album

In a video, music or photo album, press the remote's **TOOL** button to open the **TOOL** menu. The following table describes the options in this menu.

Table 6   Album > TOOL Menu

LABEL	DESCRIPTION
Add Favorite	Use this to add the photo to a favorite photos list. Note: After adding to or editing a favorites list, use the remote control's **Power** button to turn the DMA off and then back on to save your change.
Change View	Use this to select how the files display in the favorites menu. You can have them display as a list, thumbnails, or a list with thumbnails.
Sorting	Use sorting to set whether the files display in ascending or descending order.

Table 6   Album > TOOL Menu

LABEL	DESCRIPTION
Filtering	Use the filter to search for files by title (or part of a title). After you select this option and select **OK**, the on-screen keyboard displays (see Figure 13 on page 36). Use the on-screen keyboard to specify up to 16 characters of text that you want to search for in the file titles.
Slideshow Settings	Use this to configure how the slideshow changes from one photo file to the next and how long it displays each photo file.
View Current Slideshow Music	You can play music while you navigate the DMA's menus and play photo files or slideshows. When a music file is playing, you can use this option to go to the music file that is playing.
Back	Use this to exit the menu.

3.5 Playing a Video File Example

The DMA automatically arranges the video files on the media server into folders in the **VIDEO** menu. Here is an example of how to play a video file in the **All Videos** file folder. Playing music files works in a similar way.

1   Press the **VIDEO** button on the remote control or use the arrow and **OK** buttons to select the **VIDEO** icon in the **HOME** menu.

Figure 9   VIDEO Icon
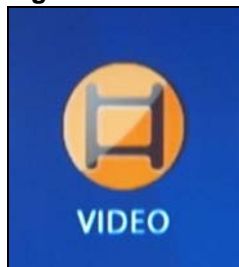
2   The **Video** menu opens.

Figure 10   VIDEO Menu
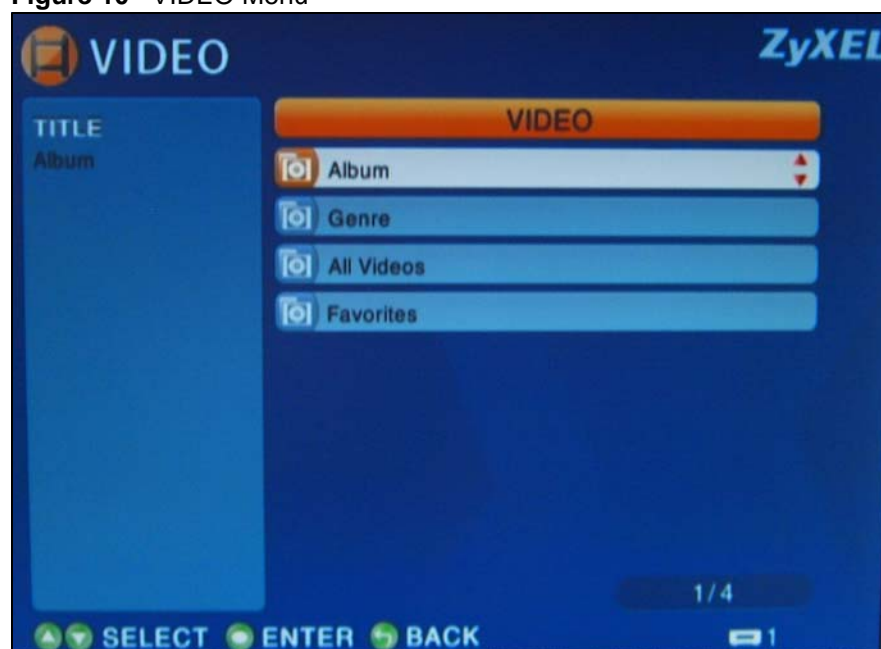
3 Use the remote control's arrow and **OK** buttons to select the **All Videos** folder.

Figure 11   VIDEO > All Videos

4 Use the remote's arrow and **OK** buttons to select and play a video file.
  • During playback, use the remote control's buttons for fast forward, reverse and pause.
  • Press the remote control's **INFO** button to display information on the screen as shown in the following figure.

Figure 12 VIDEO Playback Information Example

The following table describes the information you can display during video playback.

Table 7 VIDEO Playback Information

AREA	DESCRIPTION
A	Current function.
B	Elapsed time.
C	Audio (Left, Right or Stereo).
D	The A-B function lets you repeat a certain section of a video or music file. This can be useful for language learners wanting to repeat a particular word or phrase. See Section 3.5.1 on page 33 for an example.
E	Repeat - Keep playing (looping) the file.

3.5.1 A-B

The following example use the A-B function to set the DMA to keep repeating a section of the video starting at ten seconds into the video and ending at 30 seconds into the video.

1 Play a video or music file.

2 Press **A-B** at 0:10. The "A-" part of the **A-B** icon on the screen lights up.

3 Press **A-B** at 0:30. The rest of the **A-B** icon on the screen lights up.

4 The video or music repeats playing from A to B (0:10 to 0:30).

3.5.2 Using the TOOL Menu During Video Playback

While a video file is playing, press the remote control's **TOOL** button to open the **TOOL** menu. The following table describes the options in this menu.

Table 8   Video Playback TOOL Menu

LABEL	DESCRIPTION
Add Favorite	Use this to add the video to a favorite videos list (which you can use as a playlist). Note: After adding to or editing a favorites list, use the remote control's **Power** button to turn the DMA off and back on to save your change.
Time Search	Select this to skip to a specific time in the video. After you select this, use the arrow and **OK** buttons to select the **HOUR** and **MINUTES** input boxes. Then press numbers and the **OK** button to enter the start time. Then use the arrow and **OK** buttons to select **OK**.
Back	Use this to exit the menu.

Favorites (Playlists)

This chapter introduces the DMA's favorites feature.

4.1 Favorites (Playlists) Introduction

You can have the DMA play all of the files in a favorites folder. This is also known as a playlist.

- See Section Table 8 on page 34 for how to add files to favorites folders.
- See Section Table 13 on page 49 for how to select a favorites folder to use as the music during a slide show.

4.2 Using the TOOL Menu in the Favorites Folder

Use the **TOOL** menu to edit the playlists.

From within the **Favorites** folder, press the remote's **TOOL** button to open the **TOOL** menu. The following table describes the options in this menu.

Table 9   Favorite > TOOL Menu

TOOL MENU	DESCRIPTION
Change View	Use this to select how the files display in the favorites menu. You can have them display as a list, thumbnails, or a list with thumbnails.
Change Name	Use this to change the name of the currently selected playlist. After you select **Change Name**, select the folder's name and press **OK** to use an on-screen keyboard to edit the name. See Section 4.2.1 on page 36 for how to use the software keyboard. You can enter up to 21 characters.
Remove from Favorites	Use this to delete the currently selected file from the playlist.
Slideshow Settings	Use this to configure how a slideshow changes from one photo file to the next and how long it displays each photo file.
Detailed Information	Use this to view details about the currently selected file.
View Current Slideshow Music	You can play music while you navigate the DMA's menus and play photo files or slideshows. When a music file is playing, you can use this option to go to the music file that is playing.
Back	Use this to exit the menu.

4.2.1 Keyboard Input

When you use the **Change Name** option, you use an on-screen keyboard to edit the name.

Figure 13   Keyboard Input
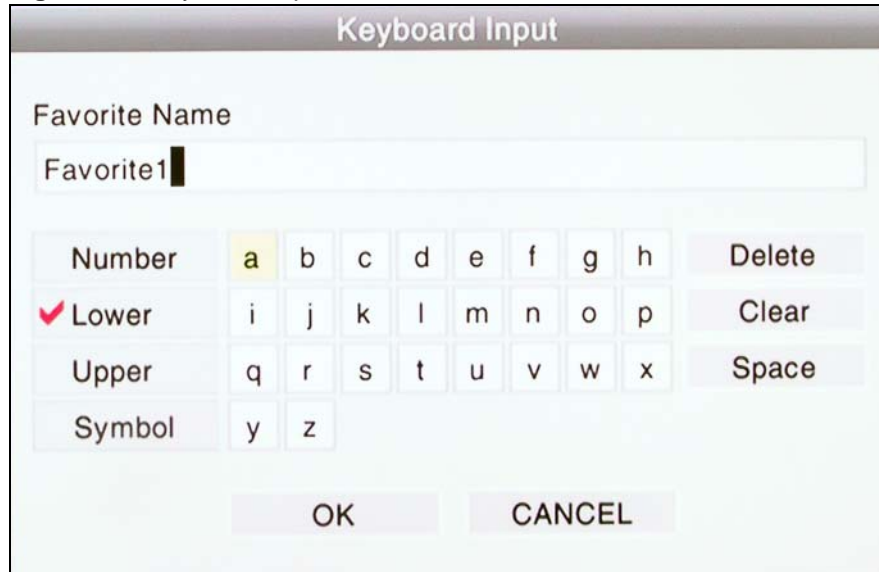
The following table describes the options in this menu.

Table 10   Keyboard Input

TOOL MENU	DESCRIPTION
Favorite Name	This is the playlist name that you are editing. Use the fields below to edit the name in this field.
Number	Select this to change the text input mode to numbers. A check mark displays next to the selected input mode.
Lower	Select this to change the text input mode to lower-case letters. A check mark displays next to the selected input mode.
Upper	Select this to change the text input mode to upper-case letters. A check mark displays next to the selected input mode.
Symbol	Select this to change the text input mode to symbols. A check mark displays next to the selected input mode.
Text Input Characters	Select characters from the center section of the screen to display in the name field.
Delete	Select this option and press **OK** to back space (delete individual characters from the name starting on the right). Press the **OK** button once for each character you want to delete.
Clear	Select this option to delete the whole name.
Space	Select this option and press OK to add a space in the name. Press the **OK** button once for each space you want to add.
OK	Select this to save your changes back to the DMA.
CANCEL	Select this to exit this screen without saving your changes.

4.2.2 Favorites Folders

In the **Favorites** folder, select a favorites folder (playlist) and press **OK** to go to that list.

- Press **Play** to start playing the play list.
- Select a file and press **OK** to play the individual file.

4.2.3 Editing Favorites Folders

Use the **TOOL** menu to edit an individual favorites folder (playlist).

Press the remote's **TOOL** button to open the **TOOL** menu.

Figure 14   Favorite > TOOL Menu

TOOL MENU
Change View
Move
Remove from Favorites
Slideshow Settings
Detailed Information
View Current Slideshow Music
Back

The following table describes the options in this menu.

Table 11   Favorite > TOOL Menu

TOOL MENU	DESCRIPTION
Change View	Use this to select how the files display in the favorites menu. You can have them display as a list, thumbnails, or a list with thumbnails.
Move	Use this to change the order of files within the playlist. After you select **Move**, select the file you want to move and then the place where you want to put it.
Remove from Favorites	Use this to delete the currently selected file from the playlist.
Slideshow Settings	Use this to configure how a slideshow changes from one photo file to the next and how long it displays each photo file.
Detailed Information	Use this to view details about the currently selected file.
View Current Slideshow Music	You can play music while you navigate the DMA's menus and play photo files or slideshows. When a music file is playing, you can use this option to go to the music file that is playing.
Back	Use this to exit the menu.

SERVER Menu

This chapter covers how to use the **SERVER** menu.

5.1 Accessing the SERVER Menu

If you have content files stored on more than one media server, use the **SERVER** menu to select the one you want to use.

To open the **SERVER** menu:

• Press the **SERVER** button on the remote control.

  or

• From the **HOME** menu, use the remote control's arrow and **OK** buttons to select the **SERVER** icon.

Figure 15   SERVER Icon
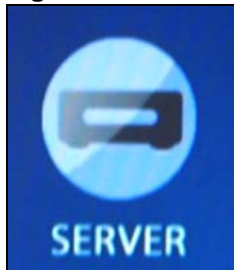
5.2 SERVER Menu

After you are in the **SERVER** menu, remote control's arrow and **OK** buttons to select the media server you want to use. The following screen displays.

Figure 16   SERVER Menu

Use the remote control to navigate to the files you want to play (or use the main menus to do so).

USB Menu

This chapter covers how to use the USB menu.

6.1 USB Menu

Use the **USB** menu to browse the contents stored on a USB device connected to the DMA.

To open the **USB** menu:

*   Press the **USB** button on the remote control.
    or
*   Use the arrow and **OK** buttons to select the **USB** icon in the **HOME** menu.

Figure 17   USB Icon

The **USB** menu displays your USB devices. Select a USB device to browse through its folders for files to play. The USB device's folders and files may just display automatically if this is the same USB device that the DMA last accessed.

Figure 18 USB Menu

MUSIC Menu

This chapter covers how to use the **MUSIC** menus.

7.1 MUSIC Menu

The DMA automatically arranges the music files on the media server into folders in the **MUSIC** menu. Use the **MUSIC** menu to select music files to play.

To open the **MUSIC** menu, press the **MUSIC** button on the remote control or use the arrow and **OK** buttons to select the **MUSIC** icon in the **HOME** screen.

Figure 19   MUSIC Icon
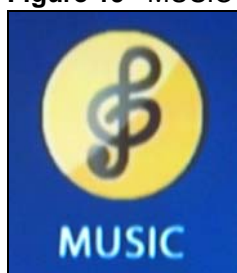
Figure 20   MUSIC Menu
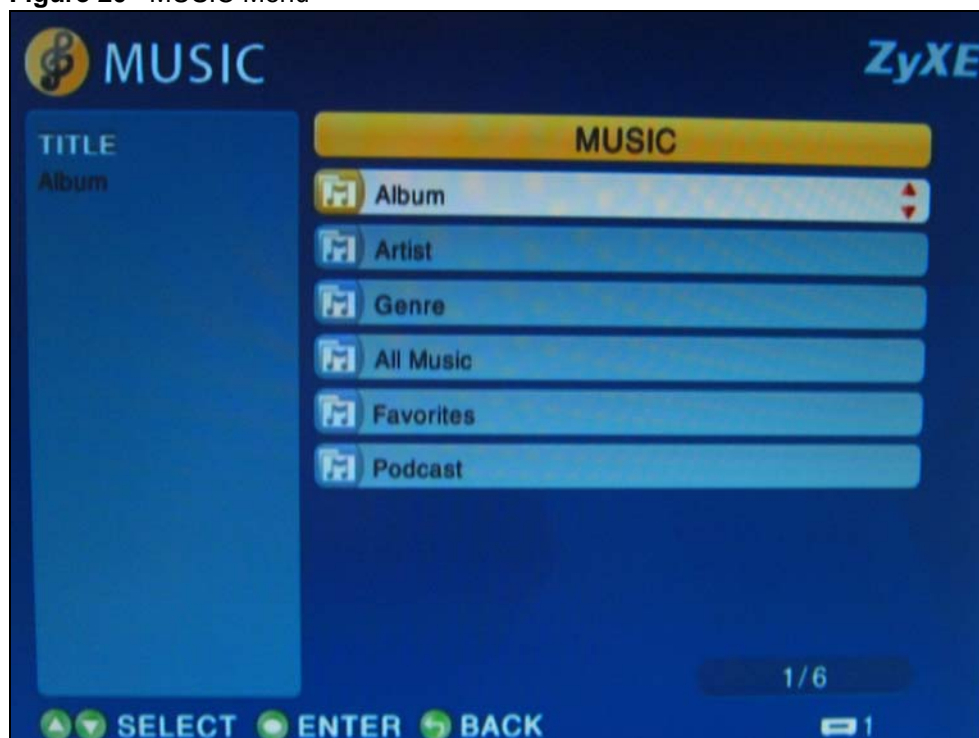
Playing music files is similar to playing video files (see Section 3.5 on page 31 for an example of how to play a video file). One key difference is that you can play music files while you use the DMA's menus or play photo files or slideshows (use the **TOOL** menu and the **View Current Slideshow Music** option to identify a music file that is playing).

7.2 Podcast (RSS)

Podcasting is a way of publishing frequently updated audio files on the Internet. You use an aggregator (also called a reader) to subscribe to podcasts. Subscribe to a podcast and you can access new audio files as they are added. You usually play the content on your computer or a portable music player like an iPod.

At the time of writing, the DMA servers as a reader for audio podcasts that use Really Simple Syndication (RSS 2.0) and iTunes RSS feeds. Websites with an RSS feed usually display an RSS icon (shown next). Add the podcast's URL in the DMA's **Podcast** menu to be able to play the feed's audio files.

Figure 21   RSS Feed Icon

7.3 Podcast Menu

Go to the **Podcast** menu within the **MUSIC** menu and press the remote control's **TOOL** button to open the **TOOL** menu. Use this menu to configure podcast and slideshow settings. The following table describes the items related to podcast settings. See

Table 12   MUSIC > Podcast Menu > TOOL Menu

TOOL MENU	DESCRIPTION
Import	You can use your computer to save a song list from the iTunes Podcast website to your USB memory stick. Then connect the USB stick to the DMA and use this import option. See Section 7.3.1 on page 45 for details.
Add Podcast	Use this to add the URL of an RSS feed that you want to listen to.
Change Podcast	Do the following to edit a podcast URL entry. Select a podcast URL entry in the **MUSIC** menu. Open the **TOOL** menu. Select **Change Podcast** to edit the podcast URL entry from the DMA.
Delete Podcast	Do the following to remove a podcast URL entry. Select a podcast entry in the **MUSIC** menu. Open the **TOOL** menu. Select **Delete Podcast** to remove the podcast entry from the DMA.
Back	Use this to exit the menu.

7.3.1 Importing Podcasts

You can import a song list from the iTunes Podcast website. You must have the iTunes program installed on your computer to do this.

1 Go to the iTunes Podcast website and select a song list.

2 Export the song list in opml format.

3 Copy the exported file onto a USB stick. Use the root (top) level, in the USB stick. Do not put the file in a folder.

4 Insert the USB stick into the DMA.

5 Press the remote control's **TOOL** button to open the **TOOLS** menu.

6 Select **Import**.

PHOTO Menu

This chapter tells how to go to and use the **PHOTO** menu.

8.1 PHOTO Menu

The DMA automatically arranges the photo files on the media server into folders in the **PHOTO** menu. Use the **PHOTO** menu to select photo files to view.

To open the **PHOTO** menu, press the **PHOTO** button on the remote control or use the arrow and **OK** buttons to select the **PHOTO** icon in the **HOME** screen.

Figure 22   PHOTO Icon
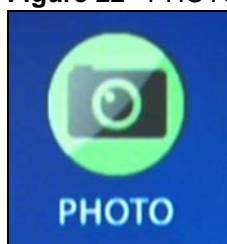
Figure 23 PHOTO Menu

8.2 Organizing Your Photos

The DMA automatically organizes your files by album according to their filenames and the folders in which they are stored.

- You can use your computer to arrange your photo files in folders to make them easier to browse.
- You can also use the **TOOL** menu to add photo files to favorites folders in the DMA to make them easier to find (see Section 8.3.1 on page 49 for details).

8.3 Slideshow

Start a slideshow from within a **PHOTO** sub-menu by using the arrow buttons to choose a photo and then pressing the **Play** button. The photos display in clockwise order starting from the selected photo.

- During a slideshow, use the **Previous**, **Play**, **Next**, **Stop**, and **Pause** buttons to control the file playback.
- Press the **ROTATE** or **Fast Forward** button to rotate a photo 90 degrees clockwise.
- Use the **Reverse** button to rotate the photo 90 degrees counter-clockwise.

8.3.1 Configuring Slideshow Settings

During a slideshow, press the remote's **TOOL** button to open the **TOOL** menu to configure the slideshow's settings. The following table describes the options in this menu.

Table 13   MUSIC Menu > TOOL Menu

LABEL	DESCRIPTION
Add Favorite	Use this to add the photo to a favorite photos list. Note: After adding to or editing a favorites list, use the remote control's **Power** button to turn the DMA off and back on to save your change.
Slideshow Music Settings	Select this to choose a music playlist (favorites list) to play during the slideshow.
Slideshow Settings	Use this to configure how the slideshow changes from one photo file to the next and how long it displays each photo file.
Back	Use this to exit the menu.

8.4 Shuffle

While playing a playlist (favorites list), use the **SHUFFLE** button to play the files in random order.

Configuring the DMA

This chapter explains how you use the remote control to configure the DMA.

9.1 Accessing the OPTION Menu

Use the **OPTION** menu to configure the DMA.

Figure 24   OPTION Icon
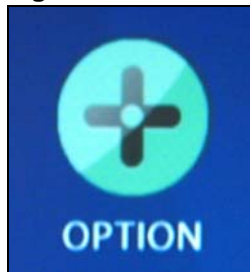
1   To open the **OPTION** menu, press the **OPTION** button on the remote control or use the arrow and **OK** buttons to select the **OPTION** icon in the **HOME** screen.

Figure 25   OPTION Menu
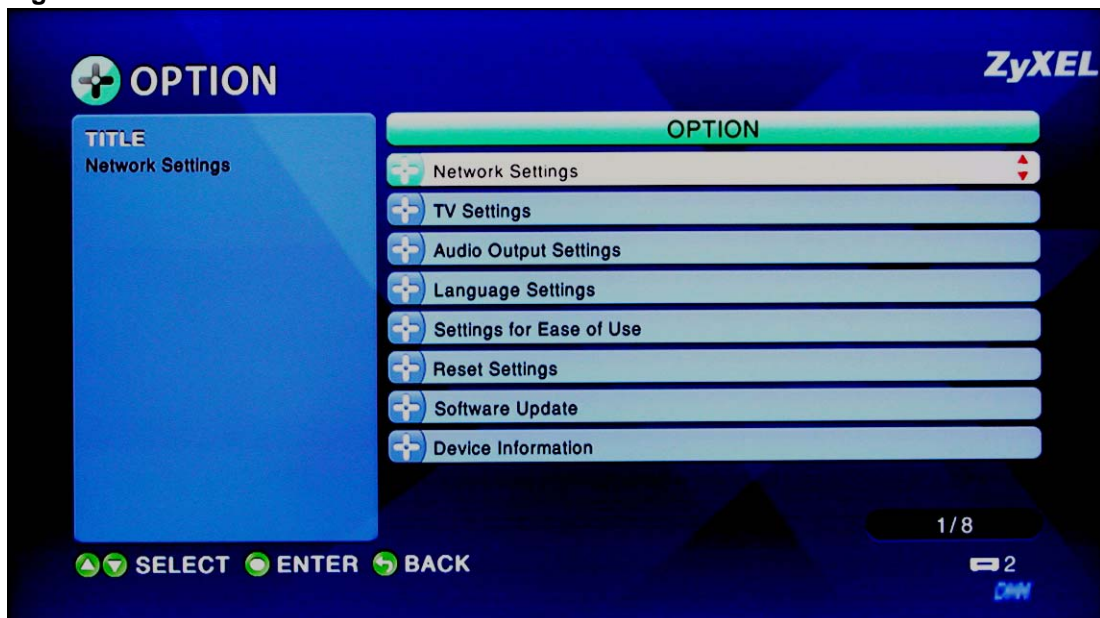
2   Use the remote's arrow and **OK** buttons to select an option sub-menu to configure.

9.2 Network Settings

The DMA needs an IP address to communicate with the media servers on your network. The DMA can get an IP address automatically if you have a device on your network that gives them out. Or you can assign the DMA a static (fixed) IP address.

9.2.1 DNS Server Address

A DNS (Domain Name System) server maps domain names (like www.zyxel.com) to their corresponding IP addresses (204.217.0.2 in the case of www.zyxel.com). This lets you use domain names to access web sites without having to know their IP addresses. The DMA can receive the IP address of a DNS server automatically (along with the DMA's own IP address). You can also manually enter a DNS server IP address in the DMA.

9.2.2 MAC Address

Every Ethernet device has a unique MAC (Media Access Control) address. The MAC address is assigned at the factory and consists of six pairs of hexadecimal characters, for example, 00:A0:C5:00:00:02.

9.3 Network Settings Menu

Use this menu to configure your DMA's settings for connecting to your wired or wireless Ethernet network.

✍ The wireless LAN settings apply to the DMA-1000W.

Select **OPTION > Network Settings** to open the following menu.

Figure 26 OPTION > Network Settings
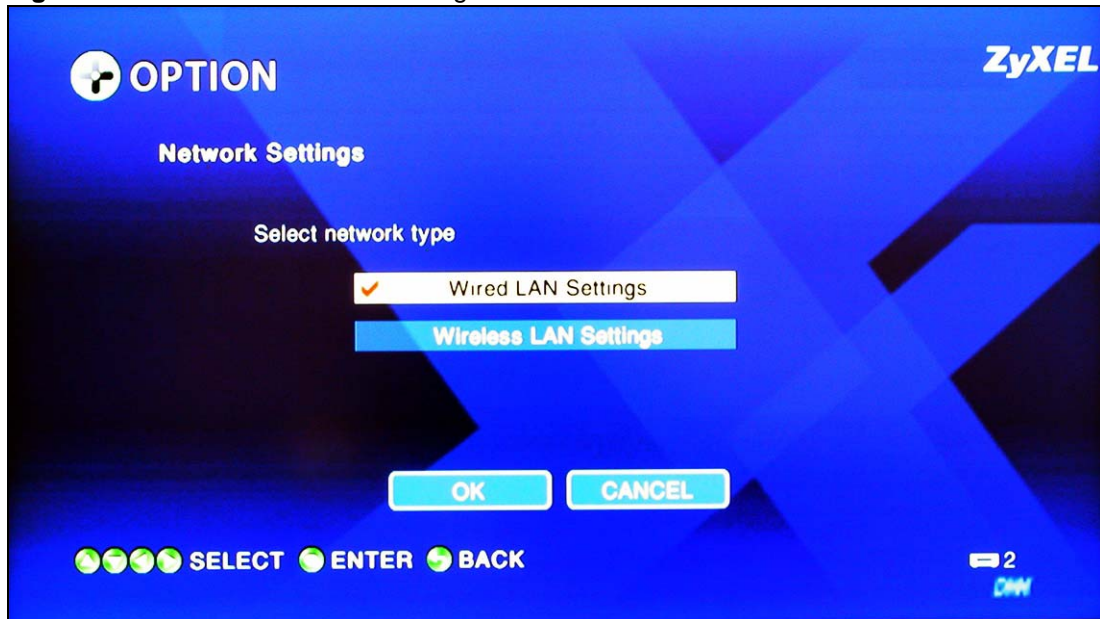
- Select **Wired LAN Settings** to configure the DMA's wired LAN settings (see).
- Select **Wireless LAN Settings** to configure the DMA's wireless LAN settings (see).

✏️ The DMA-1000W can use either a wired LAN connection or a wireless LAN connection, but only one at a time.

9.4 Wired LAN Settings

Use this menu to configure the DMA's wired LAN settings.

Figure 27   OPTION > Network Settings > Wired LAN Settings

The following table describes the fields in this menu.

Table 14   OPTION > Network Settings

LABEL	DESCRIPTION
Get IP Address	Use the arrow and **OK** buttons to select this field. Then use the arrow and **OK** buttons to select an option. Select **YES** to have the DMA get IP address information automatically. If no IP address information is assigned, the DMA uses Auto-IP to assign itself an IP address and subnet mask. For example, you could connect the DMA directly to your media server computer. If the computer is also set to get an IP address automatically, the computer and the DMA will choose addresses for themselves and be able to communicate. Select **NO** if you want to assign the DMA a static (fixed) IP address.
IP Address	Enter the IP address in this field if you selected **NO** in the **Get IP Address** field.
Subnet Mask	Enter the IP subnet mask in this field if you selected **NO** in the **Get IP Address** field.
Default gateway	Enter the gateway IP address in this field if you selected **NO** in the **Get IP Address** field.
DNS server	Enter the DNS server IP address (if your ISP gave you one) in this field if you selected **NO** in the **Get IP Address** field.
MAC Address	This field displays the MAC address of the DMA. The MAC (Media Access Control) or Ethernet address on a LAN (Local Area Network) is unique to your computer (six pairs of hexadecimal notation). A network interface card such as an Ethernet adapter has a hardwired address that is assigned at the factory. This address follows an industry standard that ensures no other adapter has a similar address.
OK	Select this to save your changes back to the DMA.
CANCEL	Select this to exit this screen without saving your changes.

9.5 Station Mode

The DMA-1000W acts as a wireless LAN client. You can either set the network type to **Infrastructure** and connect to an Access Point (AP) or use **Ad-Hoc** mode and connect to another wireless device in Ad-Hoc mode (like a computer with a wireless client) without an AP. See Section 9.7.0.2 on page 57 for how to configure the network type.

The DMA can connect to your computers on the wired network through an Access Point (AP). This is called **Infrastructure** mode.

Figure 28   Infrastructure Mode

The DMA can also connect to a computer that is a wireless client without using an AP. This is called **Ad-Hoc** mode.

Figure 29   Ad-Hoc Mode

9.6 WEP Encryption

WEP (Wired Equivalent Privacy) encryption stops unauthorized devices from using your wireless network and protects your wireless communications from eavesdropping.

WEP (Wired Equivalent Privacy) encryption scrambles all data packets transmitted between the DMA and the AP or other wireless stations to keep network communications private. The wireless stations and access point must use the same WEP key for data encryption and decryption. Encryption is like a secret code. If you do not know the secret code, you cannot decrypt (unscramble) the message.

If you do not use WEP with your DMA, the DMA's wireless communications are accessible to any wireless networking device that is in within range.

9.7 Wireless LAN Settings

Use this menu to select how you want to configure your DMA-1000W's wireless LAN settings.

Figure 30 OPTION > Network Settings > Wireless LAN Settings

- Select **Scan for wireless LANs** to have the DMA scan for available wireless networks (see Section 9.4 on page 53).
- Select **Manual Configuration** to manually enter the wireless LAN network settings (see Section 9.4 on page 53).
- Select **Windows Connect Now** to use Windows® Connect Now to save your computer's wireless settings onto a USB memory stick and then connect it to the DMA to configure the DMA's wireless settings (see Section 9.7.1 on page 58).

WCN is available on Windows XP computers with Service Pack 2 installed.

9.7.0.1 Scan for Wireless LANs

The DMA displays this menu of wireless LANs that it has detected. Select the network to which you want to connect.

Figure 31 OPTION > Network Settings > Wireless LAN Settings > Scan

The **Wireless LAN Settings Menu** displays after you select a wireless LAN, enter any security settings that the network uses (see Section 9.7.0.2 on page 57).

9.7.0.2 Wireless LAN Settings

Your DMA is a wireless LAN client. Use this menu to manually configure your wireless LAN settings.

Figure 32   OPTION > Network Settings > Wireless LAN Settings
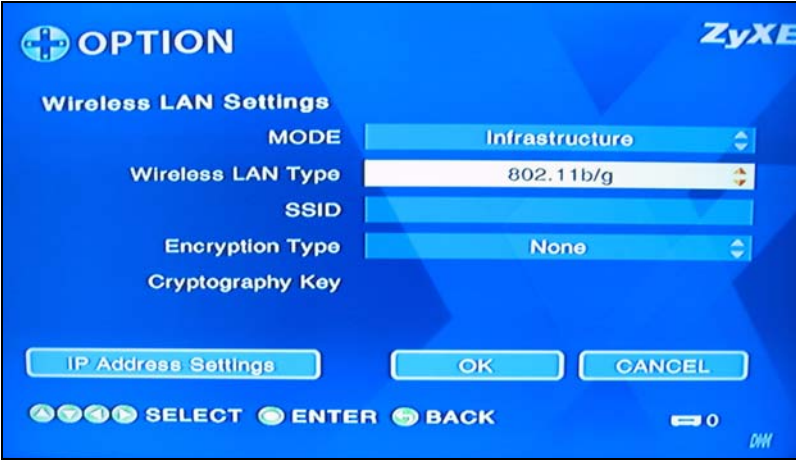
The following table describes the fields in this menu.

Table 15   OPTION > Network Settings > Wireless LAN Settings

LABEL	DESCRIPTION
Mode	Select the network type of the wireless network (**Infrastructure** or **Ad-Hoc**). Select **Infrastructure** to connect to an AP (and configure the rest of the wireless settings to match the AP's). Select **Ad-Hoc** to connect to another wireless client (and configure the rest of the wireless settings to match the other wireless client's).
Wireless LAN Type	Select the wireless standard that the AP or peer device uses. Select **802.11a** to connect to an IEEE 802.11a wireless network. Select **802.11b** /**g**) to connect to either an IEEE 802.11g or IEEE 802.11b wireless device.
SSID	Enter the SSID of the wireless network to which the DMA is to associate. Select this item and use the on-screen keyboard screen (see Section 4.2.1 on page 36) to enter the SSID.
Encryption Type	Select **WEP** if your wireless LAN uses WEP encryption for security. Select **None** if your wireless LAN does not use encryption for security.

Table 15 OPTION > Network Settings > Wireless LAN Settings (continued)

LABEL	DESCRIPTION
Cryptography Key	The DMA uses a WEP key to encrypt data. All the devices on the wireless LAN must use the same WEP key for data transmission. Your DMA allows you to configure up to four 64-bit or 128-bit WEP keys. Only one key is used as the default key at any one time. The default key is key 1. Use the (smaller) field on the left to select a key to configure and then select the (larger) field on the right and use the on-screen keyboard screen (see Section 4.2.1 on page 36) to enter the key. A key can be 5 ASCII characters or 10 hexadecimal characters ("0-9", "A-F") if your network is using 64 bit WEP. A key can be 13 ASCII characters or 26 hexadecimal characters ("0-9", "A-F") if your network is using 128 bit WEP. Note: The values for the WEP keys must be set up exactly the same on all wireless devices in the same wireless LAN. Note: ASCII WEP keys are case sensitive.
IP Address Settings	Select this button to go to a menu similar to the **Wired LAN settings** menu (see Section 9.4 on page 53 for details).
OK	Select this to save your changes back to the DMA.
CANCEL	Select this to exit this screen without saving your changes.

9.7.1 Wireless LAN Setup Using Windows® Connect Now

Windows® Connect Now lets you save your computer's wireless settings to a USB memory stick. Then you can connect the USB stick to the DMA to configure the DMA's wireless settings. This allows you to easily set up a wireless LAN. To take advantage of this feature, you need:

- A USB memory stick with at least 300K of available memory.
- Windows XP with Service Pack 2 (SP2).

Follow the steps below to set up a wireless LAN using Windows® Connect Now. You do not need to connect the USB stick to the computer yet, you will be prompted to do so later.

1 Click **Start** > **Control Panel** and double-click **Wireless Network Setup Wizard**.
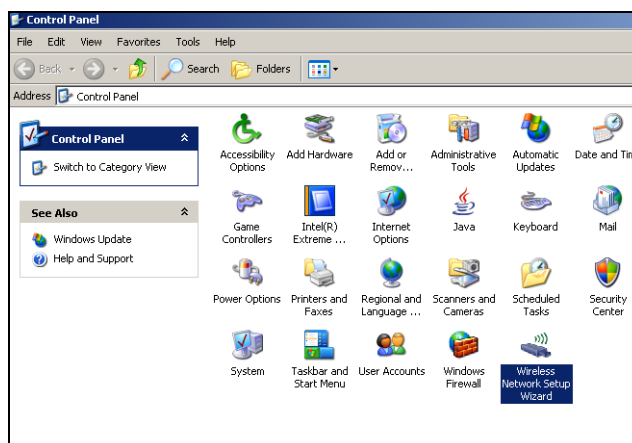
2 The first wizard screen displays. Click **Next** in each screen to continue.

3 Select **Set up a new wireless network to configure a new wireless network**.

4 In the **Network name (SSID)** field, specify a unique name to identify your wireless LAN.

5 Select **Automatically assign a network key to have Windows create a security key**.
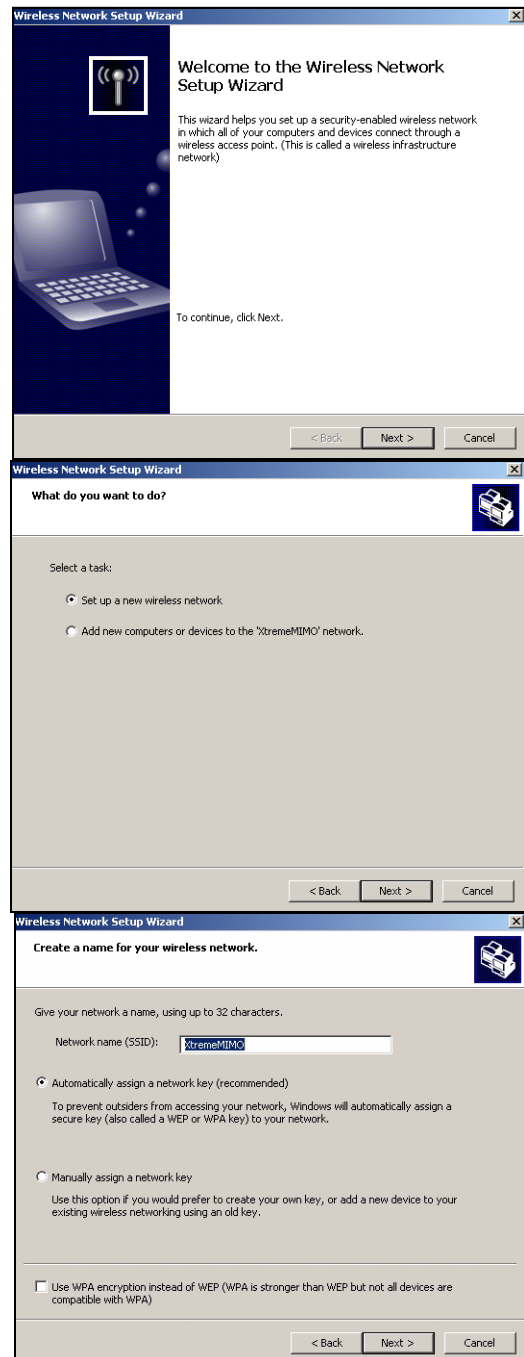
6 Select **Use a USB Flash drive to set up a wireless network**.

7 Connect the USB memory stick to your computer's USB port.

8 This screen appears after your wireless settings are saved on the USB stick.
   - Remove the USB stick from your computer and insert it in the DMA's **USB** port.
   - Go to the **Wireless LAN settings** menu and select **Windows Connect Now** (see Section Figure 30 on page 56).
   - After the DMA's wireless settings are configured, remove the USB stick from the DMA and insert it back into your computer's USB port and click **Next**.
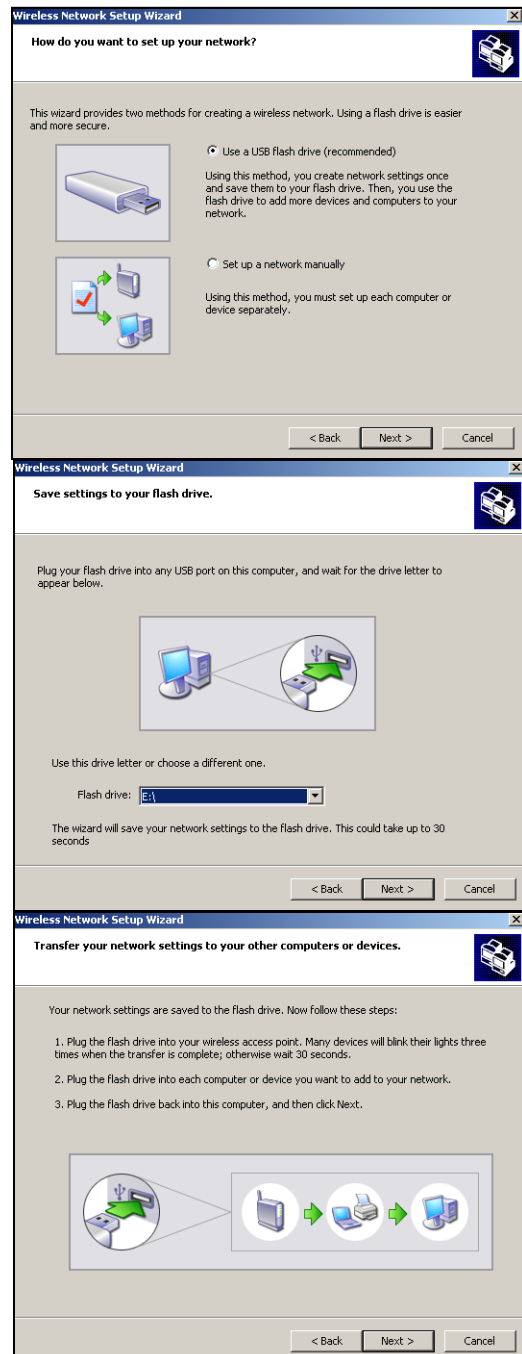
9 This screen displays when you have successfully set up a secure wireless network. Click **Finish**.
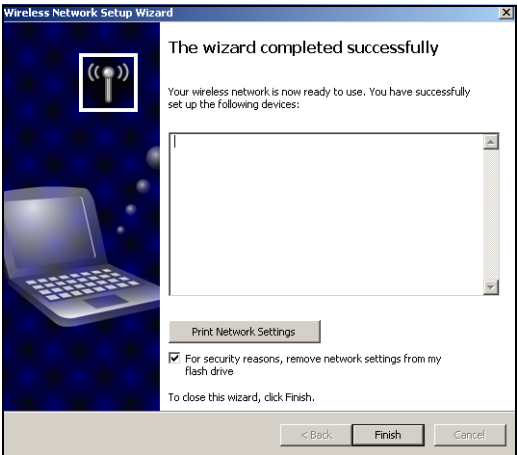
9.8 Video Modes

The DMA supports 480i, 480p, 720p and 1080i video modes. 720p and 1080i are high definition television modes. 480i is used with most standard definition televisions. The number ("1080" for instance) stands for the number of lines of vertical resolution. The letter "i" stands for interlaced scan. The letter "p" stands for progressive scan. Progressive scan provides higher picture quality than interlaced but requires twice the bandwidth.

9.9 TV Settings

Use this menu to configure the video output that the DMA sends to your television.

Select **OPTION > TV Settings** to open the following menu.

Figure 33   OPTION > TV Settings

The following table describes the fields in this menu.

Table 16 OPTION > TV Settings

LABEL	DESCRIPTION
Output Type	Select **Digital** if your television accepts digital input. Select **Analog** if your television only accepts analog input.
Screen Size	Select **16:9** if your television supports the 16:9 format (widescreen). Select **4:3** if your television supports the 4:3 format (traditional television).
Resolution	Select a video mode. Use the highest number that your television supports. Select from **480i**, **480p**, **720p** and **1080i**. You can also select **Auto** when the **Output Type** is set to **Digital**.
OK	Select this to save your changes back to the DMA.
CANCEL	Select this to exit this screen without saving your changes.

9.10 Audio Settings

✎ The DMA only provides 2 channel (stereo) output. When the DMA plays 5.1 channel files, it downmixes the analog or digital input and provides 2 channel (stereo) analog or digital output.

Use this menu to configure the DMA's audio output for music playback. You can turn the S/PDIF connector's output (the DMA's digital output) on or off for individual audio formats. The analog output is always on. You can also select how much volume smoothing you want during audio file playback.

See Section 9.10.1 on page 64 for details on the individual audio formats.

Select **OPTION > Audio Output Settings** to open the following menu.

Figure 34 OPTION > Audio Output Settings

The following table describes the fields in this menu.

Table 17 OPTION > Audio Output Settings

LABEL	DESCRIPTION
Analog Output	The DMA sends two channel (also called left and right or stereo) audio output through the **LEFT** and **RIGHT** audio connectors for music files.
S/PDIF Output	Use this column to turn the S/PDIF connector's output (the DMA's digital output) on or off for individual audio formats.
AAC	Select whether or not the DMA sends digital audio output through the S/PDIF audio connector for AAC music files. Select **LPCM** to turn on the channel digital output (also called left and right or stereo) for AAC music files. Select **OFF** to turn off the digital output for AAC music files.
Dolby Digital	Select whether or not the DMA sends digital audio output through the S/PDIF audio connector for Dolby Digital music files. Select **LPCM** to turn on the channel digital output (also called left and right or stereo) for Dolby Digital music files. Select **OFF** to turn off the digital output for Dolby Digital music files.
WMA	Select whether or not the DMA sends digital audio output through the S/PDIF audio connector for WMA music files. Select **LPCM** to turn on the channel digital output (also called left and right or stereo) for WMA music files. Select **OFF** to turn off the digital output for WMA music files.
Auto Volume Control Strength	Automatic volume control averages the volume during music playback to help smooth out the sound level. Select the amount of volume smoothing you want for music playback. **None** provides no volume smoothing. **Small** provides a low degree of volume smoothing. **Moderate** provides some volume smoothing. **Strong** provides the greatest degree of volume smoothing.
OK	Select this to save your changes back to the DMA.
CANCEL	Select this to exit this screen without saving your changes.

### 9.10.1 Audio Formats

This section provides background information on audio formats mentioned in the previous section.

9.10.1.1 S/PDIF

S/PDIF (Sony/Philips Digital Interface Format) is also IEC 958 type II, part of IEC-60958. S/PDIF is a collection of low-level protocol and hardware specifications for carrying digital audio signals between devices and stereo equipment.

9.10.1.2 AAC

AAC (Advanced Audio Coding) is a standardized digital audio compression method. Sony, AT&T, Dolby, Nokia, Fraunhofer (FhG) and other companies cooperated to develop AAC to provide improved performance compared to MP3 (MPEG-1 Audio Layer 3). Various products including Apple's iTunes and iPod, the Sony PlayStation 3 and many cell phones support AAC playback. AAC has been promoted as the successor to MP3 although at the time of writing, MP3 still remains popular. AAC is also known as MPEG-4 AAC because it is included in the Moving Pictures Experts Group (MPEG) MPEG-4 standard.

9.10.1.3 Dolby Digital

Dolby Digital is one of several audio compression technologies (codecs) produced by Dolby Laboratories.

Dolby Digital (also called AC-3) is the most common version. It contains up to six discrete channels of sound. Five channels for normal-range speakers (right front, center, left front, right rear and left rear) and one channel for the subwoofer. This is often abbreviated as 5.1. The Dolby Digital format also supports mono and stereo usage.

Dolby Digital is also known as DD, DD 5.1, Dolby Surround AC-3 Digital, Dolby Stereo Digital, Dolby SR-Digital, SR-D, Adaptive Transform Coder 3, AC-3, Audio Codec 3, Advanced Codec 3, Acoustic Coder 3, ATSC A/52, and ATSC A/52 Rev. B.

9.10.1.4 WMA

WMA (Windows Media Audio) is Microsoft's proprietary audio compression format. Although WMA has not been nearly as popular as MP3, WMA Pro is part of Microsoft's Windows Media framework and is positioned as a competitor to AAC. Many consumer devices and media players support the playback of WMA files.

9.10.1.5 LPCM

LPCM (Linear Pulse Code Modulation is a method for digitally encoding audio information. In LPCM an audio waveform is represented by a sequence of amplitude values recorded at a sequence of times. LPCM most commonly supports two audio channels (stereo).

9.11 Language Settings

Use this menu to select the language that the DMA menus use.

Select **OPTION > Language Settings** to open the following menu.

Figure 35 OPTION > Language Settings

The following table describes the fields in this menu.

Table 18 OPTION > Language Settings

LABEL	DESCRIPTION
Language Settings	Select the language that you want the DMA menus to use. A check mark appears next to the current display language.
OK	Select this to save your changes back to the DMA.
CANCEL	Select this to exit this screen without saving your changes.

9.12 Settings For Ease of Use

Use this menu to configure settings that control the DMA's operation.

Select **OPTION > Settings for Ease of Use** to open the following menu.

Figure 36   OPTION > Settings for Ease of Use
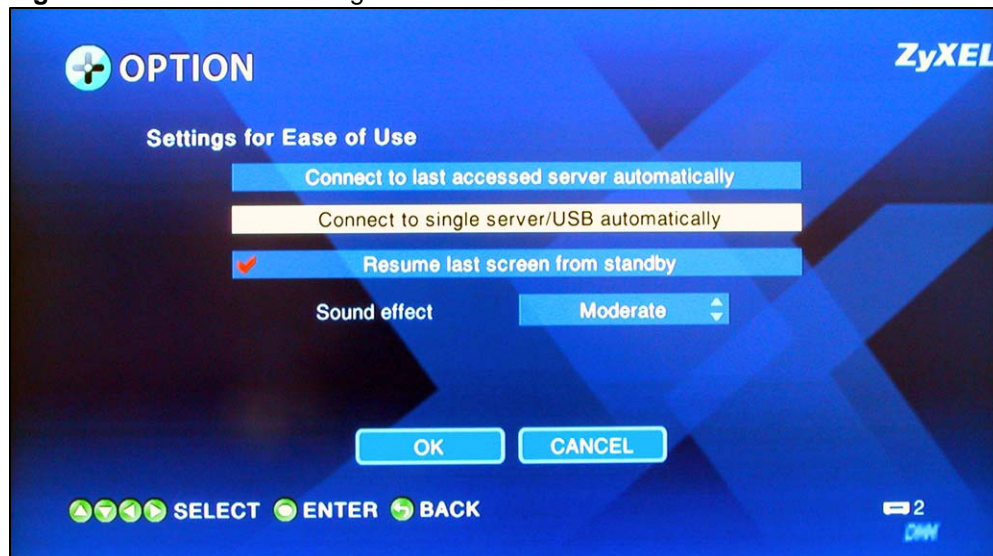
The following table describes the fields in this menu.

Table 19   OPTION > Settings for Ease of Use

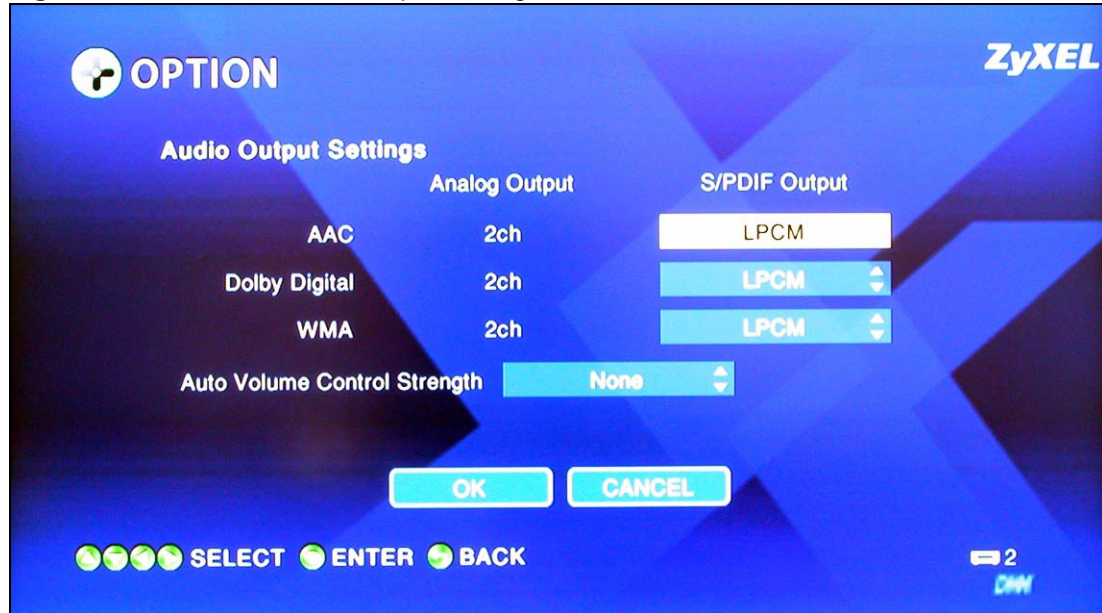| LABEL	DESCRIPTION
Connect to last accessed server automatically	When the DMA starts up, this option has it automatically connect to the media server that you last used. A check mark appears next to the option if it is selected.
Connect to single server/USB automatically	When the DMA starts up, this option has it automatically connect to the media server or USB device that you last used. A check mark appears next to the option if it is selected.
Resume last screen from standby	If you were playing a file when you turned off the DMA, this option has the DMA automatically continue playback from where you left off when you turn the DMA back on. A check mark appears next to the option if it is selected.
Sound effect	Set how loud you want the DMA to beep when you press buttons on the remote control.
OK	Select this to save your changes back to the DMA.
CANCEL	Select this to exit this screen without saving your changes.

9.13 Reset Settings

Use this menu to set the DMA back to the factory default settings.

?   You will lose all of your changes when you reset to the default settings.

Select **OPTION > Reset Settings** to open the following menu.

Figure 37   OPTION > Reset Settings
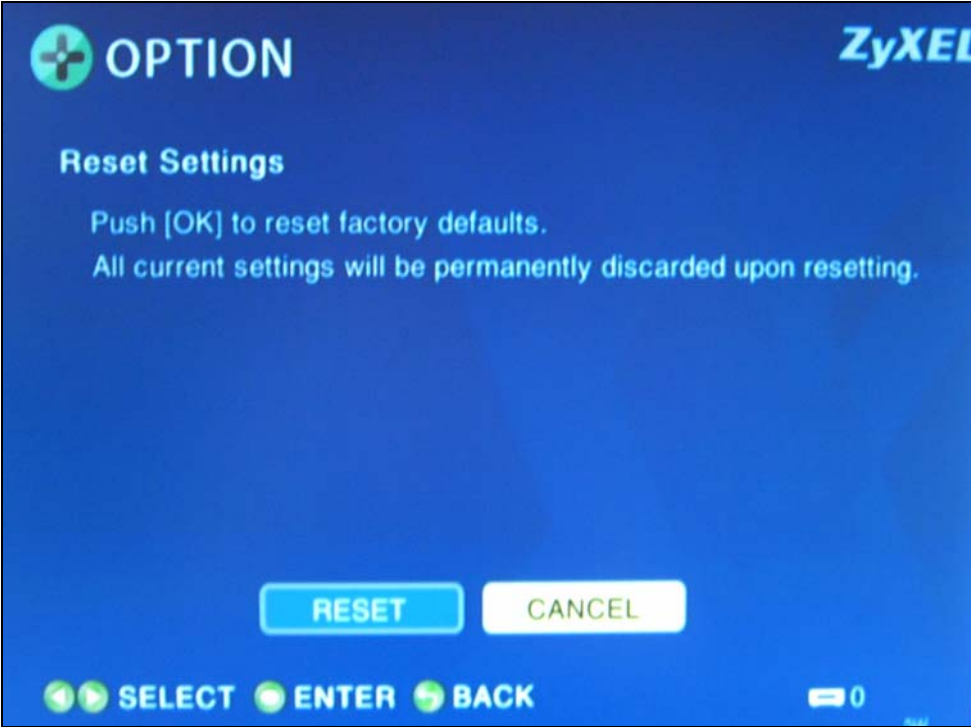
The following table describes the fields in this menu.

Table 20   OPTION > Reset Settings

LABEL	DESCRIPTION
RESET	Select this to restore all of the DMA's settings to the factory defaults.
CANCEL	Select this to exit this screen without saving your changes.

9.14 Software Update

Use this menu to upload new software to the DMA.

> Only use software for your device's specific model. Refer to the label on the bottom of your DMA.

Select **OPTION > Software Update** to open the following menu.

Figure 38   OPTION > Software Update
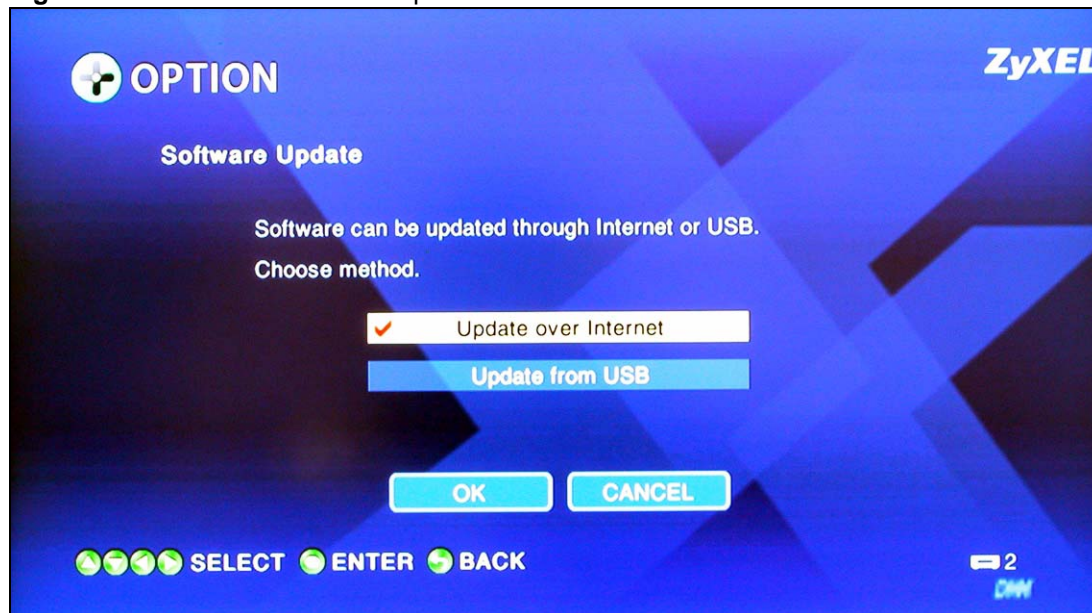
The following table describes the fields in this menu.

Table 21   OPTION > Software Update

LABEL	DESCRIPTION
Update over Internet	Select this option and follow the on-screen instructions to have the DMA check for and download new software from a server. The DMA must be connected to the Internet in order to do this. A check mark appears next to the option if it is selected.
Update from USB	Select this option and follow the on-screen instructions to have the DMA download new software from a USB stick. You must first download the software file, unzip it and put it on a USB stick. Find software at www.zyxel.com in a file that (usually) uses the system model name with a .bin extension, for example, "DMA-1000.bin". A check mark appears next to the option if it is selected.
OK	Select this to save your changes back to the DMA.
CANCEL	Select this to exit this screen without saving your changes.

Do not turn off the DMA while software upload is in progress!

The upload process may take up to two minutes. After a successful upload, the system will reboot. See Section 9.15 on page 68 for how to check the software version to know if the new software upload was successful.

9.15 Device Information

Use this menu to display information about the DMA.

Select **OPTION > Device Information** to open the following menu.

Figure 39 OPTION > Device Information
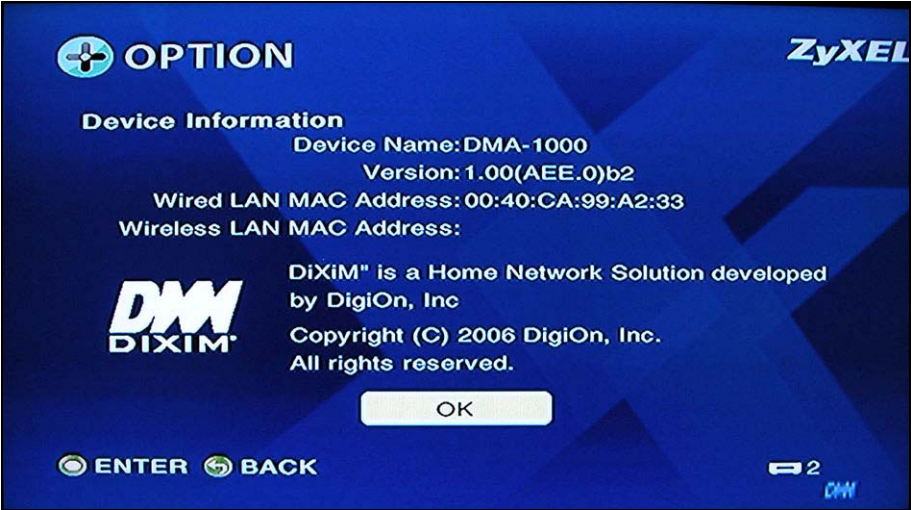
The following table describes the fields in this menu.

Table 22 OPTION > Device Information

LABEL	DESCRIPTION
Device Name	This is the name of the series to which your device belongs.
Version	This is the version of the software currently on the DMA. See Section 9.14 on page 67 for how to update software when there is a new version.
Wired LAN MAC Address	This field displays the MAC address of the DMA's wired Ethernet interface.
Wireless LAN MAC Address	This field displays the MAC address of the DMA-1000W's wired Ethernet interface. This field does not apply to the DMA-1000.
Sound effect	Select the sound level that you want the DMA to use for indicating remote control button presses.
OK	Select this to exit this screen.

9.16 Screen Saver

The DMA automatically displays a screen saver when it is on and you are not using it. Press any button on the remote control to return to the normal screens.

Media Server Software

This chapter introduces the media server software included on the CD.

10.1 Media Server Introduction

The DMA can play files on DLNA (Digital Living Network Alliance) compliant media servers. The DLNA is a group of leading personal computer and electronics companies that works to make products compatible and able to work in a home network in order to make digital living easy and seamless. The group's members include Nokia, Intel, Microsoft, Sony, Motorola, Philips, Samsung, Matsushita, and Hewlett-Packard.

Install the included DLNA-compliant media server software on your Windows XP computers to let the DMA play files stored on the computers.

- The software requires Windows XP.
- If you do not have Windows XP or do not want to install software, you can put your files on a USB stick. The USB stick connects directly to the DMA without need of the media server software
- You must install the media server software on each computer that you will use to share files with the DMA.
- See the Quick Start Guide for how to install the media server software and the requirement details.

The NSA-220 network storage appliance is also a media server.

10.2 Media Server Tool

Use the media server tool to configure the media server settings. Do one of the following to start the media server tool.

- Click **Start > All Programs > DigiOn > DiXiM Media Server Tool**.
- Double-click the DiXiM icon in the system tray (see the following figure).

Figure 40   Media Server Tool Icon
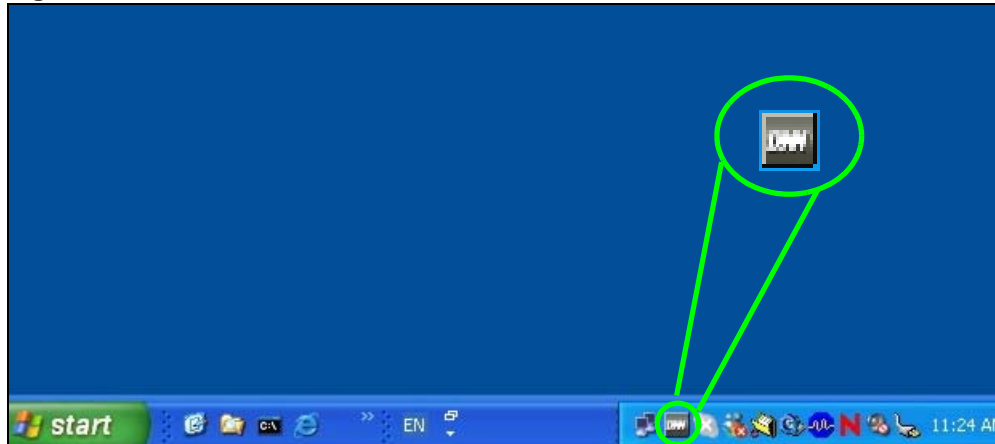
10.3 Configuring the Media Server Software

Refer to the Quick Start Guide and the help (**Start > All Programs > DigiOn > Help**) for details on how to configure and use the media server software.

Troubleshooting

This chapter offers some suggestions to solve problems you might encounter. The potential problems are divided into the following categories.

- Power, Hardware Connections, and LEDs
- DMA Usage

11.1 Power, Hardware Connections, and LEDs

? None of the LEDs turn on.

1 Make sure the DMA is turned on.
2 Make sure you are using the power adaptor or cord included with the DMA.
3 Make sure the power adaptor or cord is connected to the DMA and plugged in to an appropriate power source. Make sure the power source is turned on.
4 Turn the DMA off and on using the power switch on the rear panel (instead of the **Power** button on the remote control).
5 If the problem continues, contact the vendor.

? One of the LEDs does not behave as expected.

1 Make sure you understand the normal behavior of the LED (see Section 1.2 on page 22).
2 Check the hardware connections. See the Quick Start Guide and Section 11.1 on page 73.
3 Inspect your cables for damage. Contact the vendor to replace any damaged cables.
4 Turn the DMA off and on using the power switch on the rear panel (instead of the **Power** button on the remote control).
5 If the problem continues, contact the vendor.

11.2 DMA Usage

? I cannot see the DMA menus on the television screen.

1 Check the hardware connections, and make sure the LEDs are behaving as expected. See the Quick Start Guide and Section 11.1 on page 73.

2 Make sure your Internet browser does not block pop-up windows and has JavaScripts and Java enabled. See Section 11.1 on page 73.

3 Make sure your television is set to display the DMA's input. If you used an HDMI connection between the television and the DMA, make sure the television input is set to HDMI. If you used a S-Video connection between the television and the DMA, make sure the television input is set to S-Video.

4 Turn the DMA off and on using the power switch on the rear panel (instead of the **Power** button on the remote control).

5 If the problem continues, contact the vendor.

? I cannot see or access the media server folders on the television screen.

1 If the server icon in the bottom right of the screen has a 0, try turning the DMA off and on using the power switch on the rear panel (instead of the **Power** button on the remote control).

2 Check the hardware connections, and make sure the LEDs are behaving as expected. See the Quick Start Guide and Section 11.1 on page 73.

3 Make sure the media server computer is on and has an IP address in the same subnet as the DMA. (If you know that there are routers between your computer and the DMA, skip this step.)

4 Check the media server program's **Published Folder** and **Security** settings. If you have to change these settings, turn the DMA off and on again afterwards.

5 Check the security settings of any software firewalls on the media server computer. Make sure that any software firewalls on the media server computer are configured to allow the DMA to access the media server. See the The DMA cannot access the media server. If you have to change any firewall settings, turn the DMA off and on again afterwards.

? The DMA cannot access the media server.

Make sure that any software firewalls on the media server computers are configured to allow the DMA to access the media server.

The media server installation wizard can automatically configure the Windows XP firewall. See the media server help (**Start > All Programs > DigiOn > Help**) for instructions on how to manually configure the Windows XP firewall.

You need to configure any other software firewalls (like ZoneAlarm for example). Your software firewall may automatically prompt you when it detects the DMA's access attempts and give you the option to allow or deny access.

Use the following information to manually configure your software firewall's settings if the firewall does not automatically prompt you to allow or deny access.

APPLICATION	PROGRAM FILE NAME	FUNCTION	PORT NO.	PROTOCOL
DiXiM Media Server	dmsf.exe[A]	DiXiM SSDP[B] Discovery	1900	UDP
		DiXiM Media Server Device	30000	TCP
		DiXiM Media Server HTTP	30001	TCP

A. This file will be installed into the C:\Program Files\DigiOn\DiXiM Media Server folder by default during the installation.

B. The DMA uses SSDP (Simple Service Discovery Protocol) to find the media server.

? **The number of items in a list does not match the number of files in a media server folder.**

1 Files with unsupported formats or codecs may not display in the list. See Appendix A on page 81 for details on the supported file formats and codecs.
2 You may have Windows Media Center (WMC) and the DiXiM media server on the same computer and be sharing out the same folder. Either uninstall one of the media servers or set them to share out different folders.

? **Some of the files in my media server folder do not display in the list on the DMA.**

Files with unsupported formats or codecs may not display in the list. See Appendix A on page 81 for details on the supported file formats and codecs.

? **Some of the files in my DMA's list do not play or do not play properly.**

Files with unsupported formats or codecs may not play or may not play properly. See Appendix A on page 81 for details on the supported file formats and codecs.

? Some of my photo files do not display thumbnails.

Some files do not support thumbnails and thus will not display them.

? I cannot see the files on my USB device.

1 Make sure you have the USB device properly connected to the USB port. See the Quick Start Guide for details.
2 Files with unsupported formats or codecs may not play or may not play properly. See Section on page 81 for details on the supported file formats and codecs.
3 Turn the DMA off and on using the power switch on the rear panel (instead of the **Power** button on the remote control)
4 Try using a different USB stick.

? The A-B function does not work on some files.

Some files do not have time tags and cannot support the A-B function.

? My favorites settings were not saved.

After adding to or editing a favorites list, press the remote's **Power** button to make the DMA enter standby mode to save your change. Then press the **Power** button again to return to operation mode.

? I connected the DMA to two televisions but it only displays on one.

The DMA only provides output through one connection at a time (either the HDMI connection or the S-Video connection). Not both at the same time.

? The DMA menu display does not fill my television screen.

Check the DMA's video output settings (see Section 9.9 on page 61).

? The content playback does not fill my television screen.

1 Check the DMA's video output settings (see Section 9.9 on page 61).

2 The content may be a different format from your television. For example, a 4:3 format video file will not fill the width of a 16:9 (widescreen) format television.

? The audio on my 5.1 channel speakers does not sound right or I only hear audio from my rear left and right speakers.

When the DMA plays 5.1 channel files, it downmixes the analog or digital input and provides 2-channel (stereo) analog or digital output.

- On some 5.1 channel audio systems will only play on the rear left and right speakers.
- Some 5.1 channel audio systems can simulate the 2 channels to 5.1 channels, but the sound will not be as good as with original 5.1 channel output.

Product Specifications

General Specifications

The following tables summarize the DMA's hardware and software features.

Table 23 Hardware Specifications

Dimensions (W x D x H)	190 x 130 x 33 mm
Device Weight	0.4 kg
Power Specification	5 V DC 2 A
Ethernet Port	Auto-negotiating: 10 Mbps or 100 Mbps in either half-duplex or full-duplex mode.
Television Connectors	HDMI S-Video Right/Left RCA connectors S/PDIF coaxial RCA connector
Remote Control	Recommended operating range up to 5 m. Point the remote control at the front of the DMA at an angle of no less than 30 degrees.
Wireless LAN Output Power	IEEE 802.11b = 21.05 dBm IEEE 802.11g = 18.15 dBm
External Antenna	One 2.95 dBi (maximum) antenna
USB Port	USB version 2.0, type A
Operation Temperature	0º C ~ 50º C
Storage Temperature	-20º C ~ 60º C
Operation Humidity	20% ~ 95% RH
Storage Humidity	10% ~ 90% RH
Distance between the centers of the holes (for wall mounting) on the device's back.	137 mm
Recommended type of screws for wall-mounting	M4 Tap Screw, see Figure 42 on page 86.

Table 24   Software Specifications

FEATURE	DESCRIPTION
Default IP Address	DHCP client. If no DHCP server is found, the DMA uses Auto-IP to choose an IP address in the 169.254.X.X subnet (where X is a number from 1 to 254).
Default Subnet Mask	DHCP client by default. If no DHCP server is found, the subnet mask defaults to 255.255.255.0 (24 bits).
Wireless LAN Standards	(DMA-1000W only) IEEE 802.11a, IEEE 802.11b, IEEE 802.11g
Wireless Security	(DMA-1000W only) 64-bit and 128-bit WEP
Device Management	On (television) screen using the remote control
Software Upgrade	Upload new software (when available) from the ZyXEL web site. Or download the new software from the ZyXEL web site and use a USB stick to put it on the DMA. Note: Only upload software for your specific model!
Configuration Reset	The DMA provides an option for restoring the default settings.
DHCP (Dynamic Host Configuration Protocol) Client	The DMA can receive IP addresses, an IP default gateway and DNS servers via DHCP.
Universal Plug and Play (UPnP)	A UPnP-enabled device can dynamically join a network, obtain an IP address and convey its capabilities to other devices on the network.
Media Sharing	DLNA compliant client.
Favorites (Playlist)	Set up lists of files to play.
Audio Input Formats Supported	Dolby Digital, DVD-Audio, MPEG-1 and MPEG-2 Layers I, II and III(MP3), MPEG-2 BC multi-channel Layers I, II and III, MPEG-2 and MPEG-4 AAC-LC, WMA9. See page 81 for details.
Podcast RSS Feeds Supported	RSS 2.0 and iTunes RSS
Video Input Formats Supported	MPEG-1, MPEG-2 MP@ML, MPEG-4 simple and advanced simple profile, MPEG-4 AVI files and WMV version 9. See page 81 for details.
Photo Input Formats Supported	TIFF, PNG, GIF, BMP, JPEG, and JPEG2000. See page 81 for details.
Video Output Formats	Digital, analog 4:3, 16:9 480i, 480p, 720p and 1080i
Audio Output Formats	two channel (stereo)

The following list, which is not exhaustive, illustrates the standards supported in the DMA.

Table 25   Standards Supported

STANDARD	DESCRIPTION
DLNA v1 Client	The DLNA (Digital Living Network Alliance) group of personal computer and electronics companies works to make products compatible and able to work in a home network in order to make digital living easy and seamless.
HDMI	HDMI (High Definition Multimedia Interface) is an interface that allows high quality, all-digital video and audio streams.

Table 25   Standards Supported (continued)

STANDARD	DESCRIPTION
IEEE 802.11	(DMA-1000W only) IEEE 8012.11 denotes a set of Wireless LAN/WLAN standards developed by working group 11 of the IEEE LAN/MAN Standards Committee (IEEE 802).
IEEE 802.11b	(DMA-1000W only) Uses the 2.4 gigahertz (GHz) band
IEEE 802.11g	(DMA-1000W only) Uses the 2.4 gigahertz (GHz) band
USB 2.0	USB (Universal Serial Bus) version 2.0 allows for interfacing devices with data transfers rates of up to 480 Mbps.

Supported Content Formats and Codecs

The following describes the details about the files that the DMA can play. Files with specifications lower or higher than the listed ranges may not play or may not play properly. For the media server software included on the CD, refer to the help (**Start > All Programs > DigiOn > Help**) for a list of file formats that the media server software can play.

Video File Formats Supported

Table 26   MPEG PS Video File Specifications

Extensions	mpg mpeg mpe m2p

Video Stream	MPEG-1, MPEG-2
	    Profile Level: up to MP@HL
	    Resolution: Maximum 1920 x 1080
	    Bit rate: VBR/CBR, Maximum 15 Mbps

Audio Stream	MPEG-1/2 Layer-II
	    Sample Frequency: Maximum 48 kHz
	    Channels: Maximum 2 Channels
	    Bit rate: VBR/CBR, Maximum 384 kbps
	LPCM
	    Sample Frequency: Maximum 48 kHz
	    Bits per sample: Maximum 16 bit
	    Channels: Maximum 2 Channels
	AC3
	    Sample Frequency: Maximum 48 kHz
	    Channels: Maximum 6 Channels
	    Bit rate: Maximum 640 kbps

Table 27   MPEG-2 TS/TTS Video File Specifications

Extensions	The DMA supports the playback of mpeg, mpg, and mpe MPEG-2 TS and TTS video files. The DMA cannot play MPEG-2 TTS files from a USB device. The DMA can play MPEG-2 TTS files shared on a media server that supports them (although the included media server software does not support them).

Video Stream	MPEG-2
	
	    Profile Level: up to MP@HL
	    Resolution: Maximum 1920 x 1080
	    Bit rate: VBR/CBR, Maximum 25 Mbps

Audio Stream	MPEG-1/2 Layer-II
	
	    Sample Frequency: Maximum 48 kHz
	    Channels: Maximum 2 Channels
	    Bit rate: VBR/CBR, Maximum 448 kbps
	AC3
	
	    Sample Frequency: Maximum 48 kHz
	    Channels: Maximum 6 Channels
	    Bit rate: Maximum 448 kbps
	MPEG-2/4 AAC LC
	
	    Sample Frequency: Maximum 48 kHz
	    Channels: Maximum 6 Channels
	    Bit rate: VBR/CBR, Maximum 384 kbps

Table 28   WMV Video File Specifications

Extensions	asf wmv

Video Stream	WMV9
	
	    Profile Level: up to MP@HL
	    Resolution: Maximum 1920 x 1080
	    Bit rate: VBR/CBR, Maximum 10 Mbps

Audio Stream	WMA8
	
	    Sample Frequency: Maximum 48 kHz
	    Channels: Maximum 2 Channels
	    Bit rate: Maximum 320 kbps
	WMA9, WMA9 Professional (WMA Lossless and Voice formats are not supported.)
	
	    Sample Frequency: Maximum 48 kHz
	    Channels: Maximum 6 Channels
	    Bit rate: VBR/CBR, Maximum 768 kbps

Notes	Combination of WMV HD and WMA Pro may result in frames being dropped. Depending on some WMV HD contents, noise may be generated in the audio signal when starting playback or during the seek operation. Contents with a Complex decoder complexity are not supported.

Table 29   AVI Video File Specifications

Extensions	avi

Table 29 AVI Video File Specifications

Video Stream	XviD, 3ivx 　　Resolution: Maximum 1280 x 720
Audio Stream	MPEG-1/2 Layer-III 　　Sample Frequency: Maximum 48 kHz 　　Channels: Maximum 2 Channels 　　Bit rate: VBR/CBR, Maximum 320 kbps AC3 　　Sample Frequency: Maximum 48 kHz 　　Channels: Maximum 6 Channels 　　Bit rate: Maximum 640 kbps

Table 30 MPEG4 Video File Specifications

Extensions	mp4
Video Stream	MPEG-4 ASP 　　Resolution: Maximum 1920 x 1080 　　Bit rate: VBR/CBR, Maximum 5 mbps
Audio Stream	MPEG-4 AAC LC 　　Sample Frequency: Maximum 48 kHz 　　Channels: Maximum 6 Channels 　　Bit rate: Maximum 448 kbps

Table 31 DVR-MS Video File Specifications

Supports content recorded by Windows Media Center Edition 2005. The DMA cannot play DVR-MS files from a USB device. The DMA can play DVR-MS files shared by the included media server software.

Table 32 IFO Video File Specifications

Supports IFO defined by DLNA 1.0 Errata. The DMA cannot play IFO files from a USB device. The DMA can play IFO files shared on a media server that supports them (although the included media server software does not support them).

Music File Formats Supported

Table 33 Music File Specifications

TYPE	EXTENSIONS	DETAILS
MP3	mp3	Audio Stream: MPEG-1/2 Layer-III Sample Frequency: Maximum 48 kHz Channels: Maximum 2 Channels Bit rate: VBR/CBR, Maximum 320 kbps ID3 tag: ID3 version 1.x, 2.2, 2.3, 2.4 tags MP3 file ID3 tags provide information like the title, name of the artist, album name, and track number. The USB browse screens can retrieve and display English language ID3 tag information. The retrieval and display of non-English language tag information is not supported.
LPCM	lpcm	The DMA cannot play LPCM files from a USB device. The DMA can play LPCM files shared on a media server that supports them. The included media server software does not share LPCM files by default. To share LPCM files, you would need to add a published file type using "lpcm" as the file extension and "audio/L16" as the MIME-TYPE. Audio Stream: LPCM Sample Frequency: Min. 8 kHz, Maximum 64 kHz Bits per sample: Maximum 16 bit Channels: Maximum 2 Channels
WAV	wav	Audio Stream: PCM Sample Frequency: Min. 8 kHz, Maximum 64 kHz Bits per sample: Maximum 16 bit Channels: Maximum 2 Channels
WMA	asf wma	Audio Stream: WMA8 Sample Frequency: Maximum 48 kHz Channels: Maximum 2 Channels Bit rate: Maximum 320 kbps Audio Stream: WMA9, WMA9 Professional (Contents with a Complex decoder complexity are not supported.) Sample Frequency: Maximum 48 kHz Channels: Maximum 6 Channels Bit rate: VBR/CBR, Maximum 768 kbps With EM8620, L2 profile WMA content must meet the following conditions. Bit rate: 48 kbps ~ 192 kbps Sample Rate: 32 kHz ~ 48 kHz
Ogg	ogg	Audio Stream: Vorbis Sample Frequency: Maximum 48 kHz Channels: Maximum 2 Channels Bit rate: ABR/CBR, Maximum 496 kbps
M4A	m4a	Audio Stream: MPEG-2/4 AAC LC Sample Frequency: Maximum 48 kHz Channels: Maximum 5.1 Channels Bit rate: CBR/VBR, Maximum 640 kbps

Photo File Formats Supported

Table 34   Photo File Specifications

TYPE	EXTENSIONS	DETAILS
JPEG	jpg jpeg	Maximum Resolution: 67174416 pixels (8196 × 8196) When displaying JPEG images that meet the conditions below, the max resolution is 67108864 pixels (8192 x 8192.) It may get smaller when the following conditions are not met. Color Space: YCbCr Not progressive mode The format is YUV420, YUV422 or YUV444 When a JPEG image's color space is RGB or grayscale, the max resolution is 983040 pixels (1280 x 768).
BMP	bmp	Maximum Resolution: Unlimited
PNG	png	Maximum Resolution: 2097152 pixels (2048 × 1024) Although transparent PNG files can be played, they will be displayed as non-transparent images.
TIFF	tif tiff	Maximum Resolution: 2097152 pixels (2048 × 1024) Compression: No compression, ZIP, LZW, Packbits, Huffman RLE, CCITT Fax 3, CCITT Fax 4
GIF	gif	Maximum Resolution: 2097152 pixels (2048 × 1024) Animation GIF formats are not supported.

Wall-mounting Instructions

Complete the following steps to hang your DMA on a wall.

✎ **See Table 23 on page 79 for the size of screws to use and how far apart to place them.**

1 Select a high position on a sturdy wall that is free of obstructions.
2 Drill two holes for the screws. The distance between the centers of the holes is listed in the product specifications appendix.

🚫 **Be careful to avoid damaging pipes or cables located inside the wall when drilling holes for the screws.**

3 Do not insert the screws all the way into the wall. Leave a small gap of about 0.5 cm between the heads of the screws and the wall.
4 Make sure the screws are snugly fastened to the wall. They need to hold the weight of the DMA with the connection cables.

5 Align the holes on the back of the DMA with the screws on the wall. Hang the DMA on the screws.

Figure 41 Wall-mounting Example
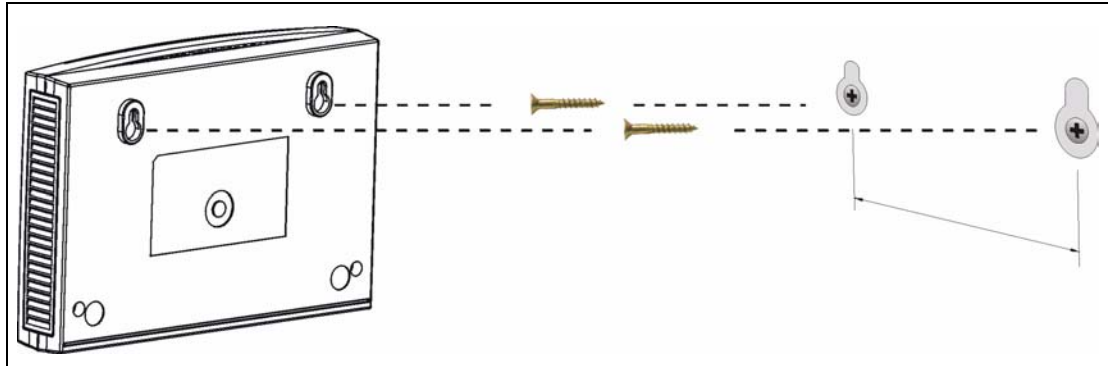
The following are dimensions of an M4 tap screw and masonry plug used for wall mounting. All measurements are in millimeters (mm).

Figure 42 Masonry Plug and M4 Tap Screw
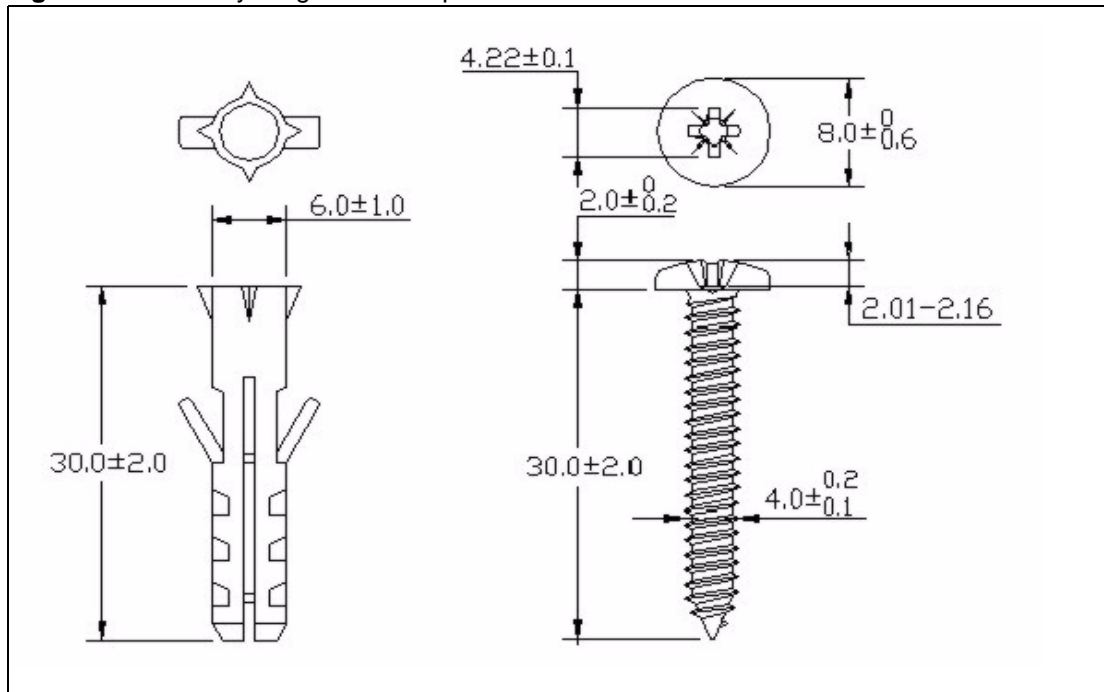
Cable Pin Assignments

Table 35 Ethernet Cable Pin Assignments

LAN ETHERNET CABLE PIN LAYOUT	
Straight-through	
(Switch)	(Adapter)
1 IRD +	1 OTD +
2 IRD -	2 OTD -
3 OTD +	3 IRD +
6 OTD -	6 IRD -

Power Adaptor Specifications

Table 36 Power Adaptor Specifications

AC Power Adaptor Model	MU12-2050200-A1
Input Power	AC 100~240 Volts/60Hz/0.25A
Output Power	DC 5 Volts/ 2A
Power Consumption	10 W
Safety Standards	UL 60950

Wireless LANs

Wireless LAN Topologies

This section discusses ad-hoc and infrastructure wireless LAN topologies.

Ad-hoc Wireless LAN Configuration

The simplest WLAN configuration is an independent (Ad-hoc) WLAN that connects a set of computers with wireless adapters (A, B, C). Any time two or more wireless adapters are within range of each other, they can set up an independent network, which is commonly referred to as an ad-hoc network or Independent Basic Service Set (IBSS). The following diagram shows an example of notebook computers using wireless adapters to form an ad-hoc wireless LAN.

Figure 43 Peer-to-Peer Communication in an Ad-hoc Network
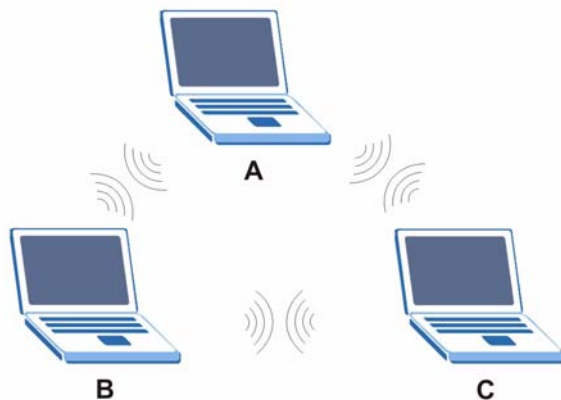
BSS

A Basic Service Set (BSS) exists when all communications between wireless clients or between a wireless client and a wired network client go through one access point (AP).

Intra-BSS traffic is traffic between wireless clients in the BSS. When Intra-BSS is enabled, wireless client **A** and **B** can access the wired network and communicate with each other. When Intra-BSS is disabled, wireless client **A** and **B** can still access the wired network but cannot communicate with each other.

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Figure 44 Basic Service Set
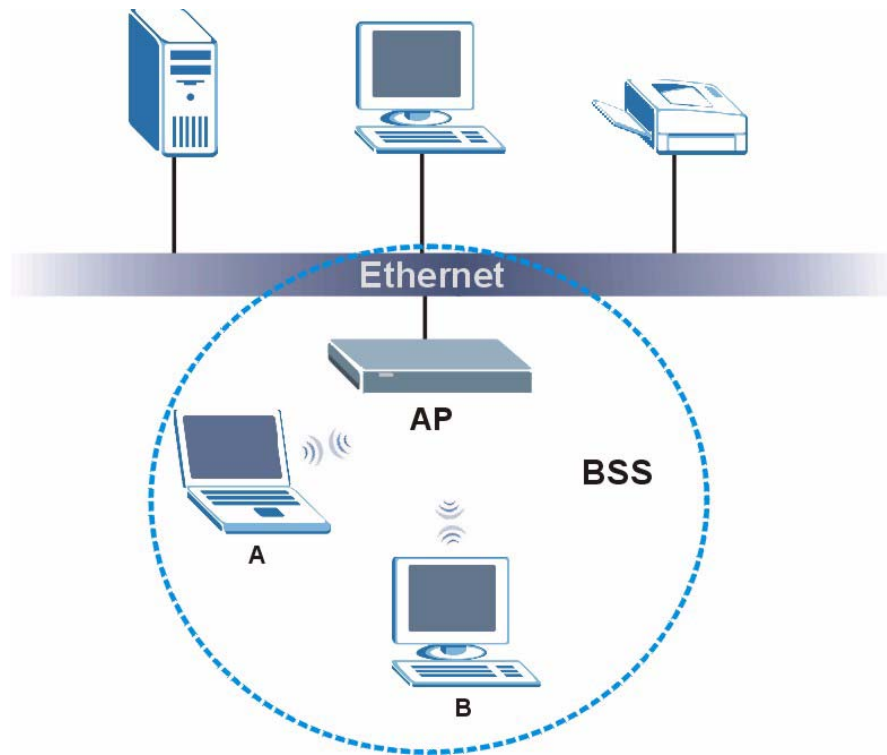
ESS

An Extended Service Set (ESS) consists of a series of overlapping BSSs, each containing an access point, with each access point connected together by a wired network. This wired connection between APs is called a Distribution System (DS).

This type of wireless LAN topology is called an Infrastructure WLAN. The Access Points not only provide communication with the wired network but also mediate wireless network traffic in the immediate neighborhood.

An ESSID (ESS IDentification) uniquely identifies each ESS. All access points and their associated wireless clients within the same ESS must have the same ESSID in order to communicate.

Figure 45   Infrastructure WLAN
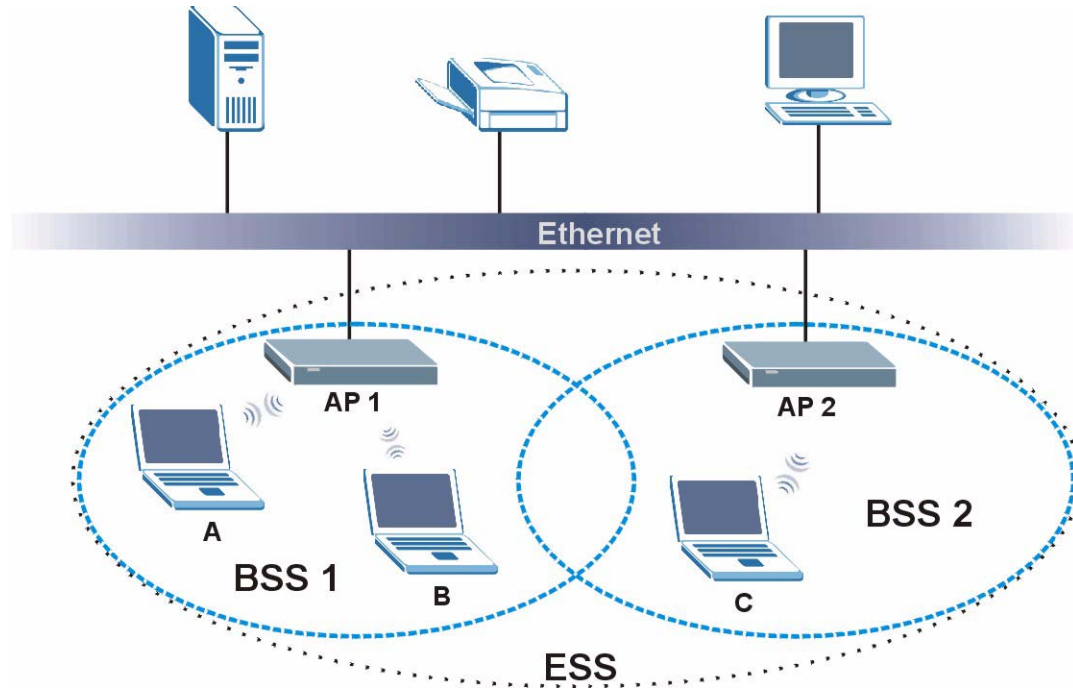
Antenna Overview

An antenna couples RF signals onto air. A transmitter within a wireless device sends an RF signal to the antenna, which propagates the signal through the air. The antenna also operates in reverse by capturing RF signals from the air.

Positioning the antennas properly increases the range and coverage area of a wireless LAN.

Antenna Characteristics

Frequency

An antenna in the frequency of 2.4GHz (IEEE 802.11b) or 5GHz(IEEE 802.11a) is needed to communicate efficiently in a wireless LAN.

Radiation Pattern

A radiation pattern is a diagram that allows you to visualize the shape of the antenna's coverage area.

Antenna Gain

Antenna gain, measured in dB (decibel), is the increase in coverage within the RF beam width. Higher antenna gain improves the range of the signal for better communications.

For an indoor site, each 1 dB increase in antenna gain results in a range increase of

approximately 2.5%. For an unobstructed outdoor site, each 1dB increase in gain results in a range increase of approximately 5%. Actual results may vary depending on the network environment.

Antenna gain is sometimes specified in dBi, which is how much the antenna increases the signal power compared to using an isotropic antenna. An isotropic antenna is a theoretical perfect antenna that sends out radio signals equally well in all directions. dBi represents the true gain that the antenna provides.

Types of Antennas for WLAN

There are two types of antennas used for wireless LAN applications.

- Omni-directional antennas send the RF signal out in all directions on a horizontal plane. The coverage area is torus-shaped (like a donut) which makes these antennas ideal for a room environment. With a wide coverage area, it is possible to make circular overlapping coverage areas with multiple access points.
- Directional antennas concentrate the RF signal in a beam, like a flashlight does with the light from its bulb. The angle of the beam determines the width of the coverage pattern. Angles typically range from 20 degrees (very directional) to 120 degrees (less directional). Directional antennas are ideal for hallways and outdoor point-to-point applications.

Positioning Antennas

In general, antennas should be mounted as high as practically possible and free of obstructions. In point-to–point application, position both antennas at the same height and in a direct line of sight to each other to attain the best performance.

For omni-directional antennas mounted on a table, desk, and so on, point the antenna up. For omni-directional antennas mounted on a wall or ceiling, point the antenna down. For a single AP application, place omni-directional antennas as close to the center of the coverage area as possible.

For directional antennas, point the antenna in the direction of the desired coverage area.

C

Setting up Your Computer's IP Address

All computers must have a 10M or 100M Ethernet adapter card and TCP/IP installed.

Windows 95/98/Me/NT/2000/XP, Macintosh OS 7 and later operating systems and all versions of UNIX/LINUX include the software components you need to install and use TCP/IP on your computer. Windows 3.1 requires the purchase of a third-party TCP/IP application package.

TCP/IP should already be installed on computers using Windows NT/2000/XP, Macintosh OS 7 and later operating systems.

After the appropriate TCP/IP components are installed, configure the TCP/IP settings in order to "communicate" with your network.

If you manually assign IP information instead of using dynamic assignment, make sure that your computers have IP addresses that place them in the same subnet as the DMA's LAN port.

Windows 95/98/Me

Click **Start**, **Settings**, **Control Panel** and double-click the **Network** icon to open the **Network** window.

Figure 46 WIndows 95/98/Me: Network: Configuration
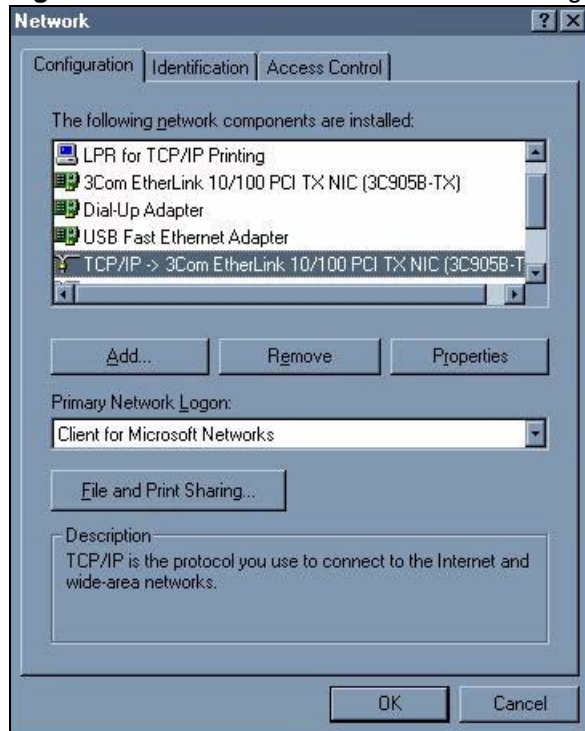
Installing Components

The **Network** window **Configuration** tab displays a list of installed components. You need a network adapter, the TCP/IP protocol and Client for Microsoft Networks.

If you need the adapter:

1 In the **Network** window, click **Add**.

2 Select **Adapter** and then click **Add**.

3 Select the manufacturer and model of your network adapter and then click **OK**.

If you need TCP/IP:

1 In the **Network** window, click **Add**.

2 Select **Protocol** and then click **Add**.

3 Select **Microsoft** from the list of **manufacturers**.

4 Select **TCP/IP** from the list of network protocols and then click **OK**.

If you need Client for Microsoft Networks:

1 Click **Add**.

2 Select **Client** and then click **Add**.

3 Select **Microsoft** from the list of manufacturers.

4 Select **Client for Microsoft Networks** from the list of network clients and then click **OK**.

5 Restart your computer so the changes you made take effect.

Configuring

1 In the **Network** window **Configuration** tab, select your network adapter's TCP/IP entry and click **Properties**

2 Click the **IP Address** tab.

- If your IP address is dynamic, select **Obtain an IP address automatically**.
- If you have a static IP address, select **Specify an IP address** and type your information into the **IP Address** and **Subnet Mask** fields.

Figure 47   Windows 95/98/Me: TCP/IP Properties: IP Address
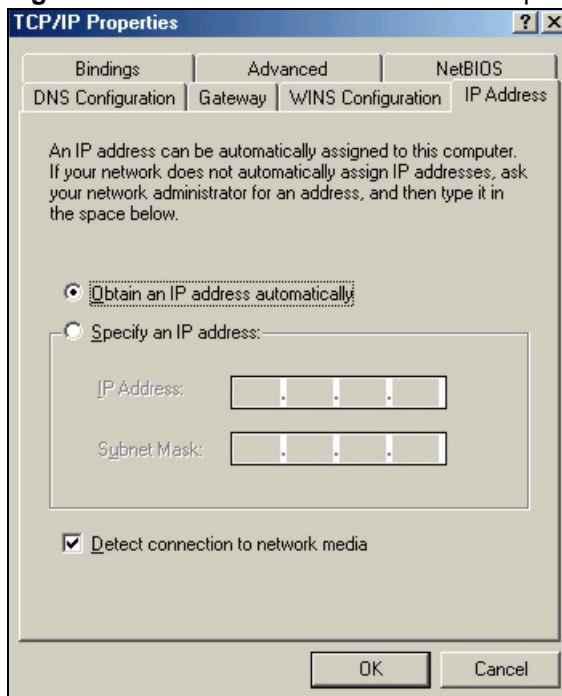
3 Click the **DNS** Configuration tab.

- If you do not know your DNS information, select **Disable DNS**.
- If you know your DNS information, select **Enable DNS** and type the information in the fields below (you may not need to fill them all in).

Figure 48   Windows 95/98/Me: TCP/IP Properties: DNS Configuration
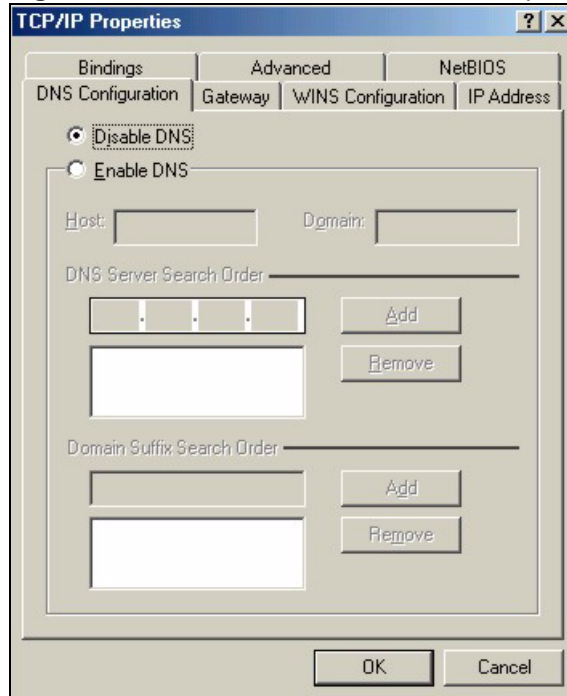
4 Click the **Gateway** tab.

- If you do not know your gateway's IP address, remove previously installed gateways.
- If you have a gateway IP address, type it in the **New gateway field** and click **Add**.

5 Click **OK** to save and close the **TCP/IP Properties** window.

6 Click **OK** to close the **Network** window. Insert the Windows CD if prompted.

7 Turn on your DMA and restart your computer when prompted.

Verifying Settings

1 Click **Start** and then **Run**.

2 In the **Run** window, type "winipcfg" and then click **OK** to open the **IP Configuration** window.

3 Select your network adapter. You should see your computer's IP address, subnet mask and default gateway.

Windows 2000/NT/XP

The following example figures use the default Windows XP GUI theme.

1 Click **start** (**Start** in Windows 2000/NT), **Settings**, **Control Panel**.

Figure 49   Windows XP: Start Menu
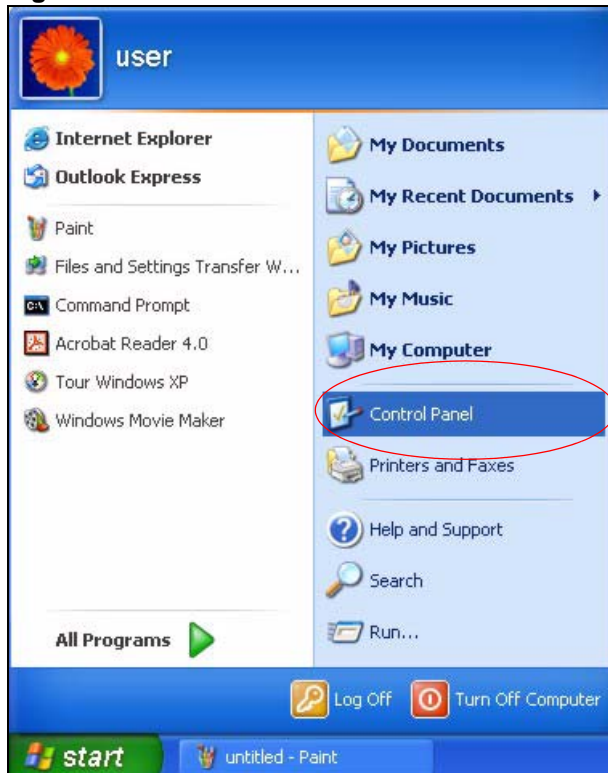
2   In the **Control Panel**, double-click **Network Connections** (**Network and Dial-up Connections** in Windows 2000/NT).

Figure 50   Windows XP: Control Panel
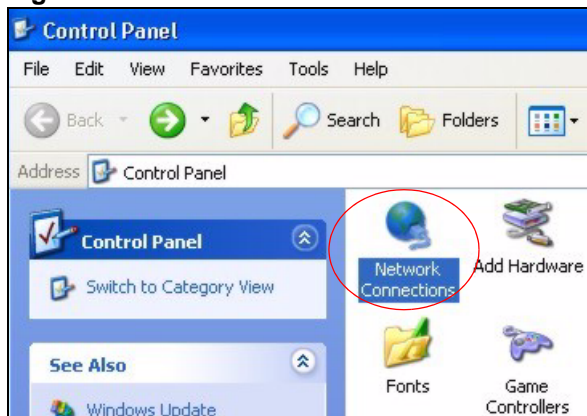
3   Right-click **Local Area Connection** and then click **Properties**.

Figure 51 Windows XP: Control Panel: Network Connections: Properties
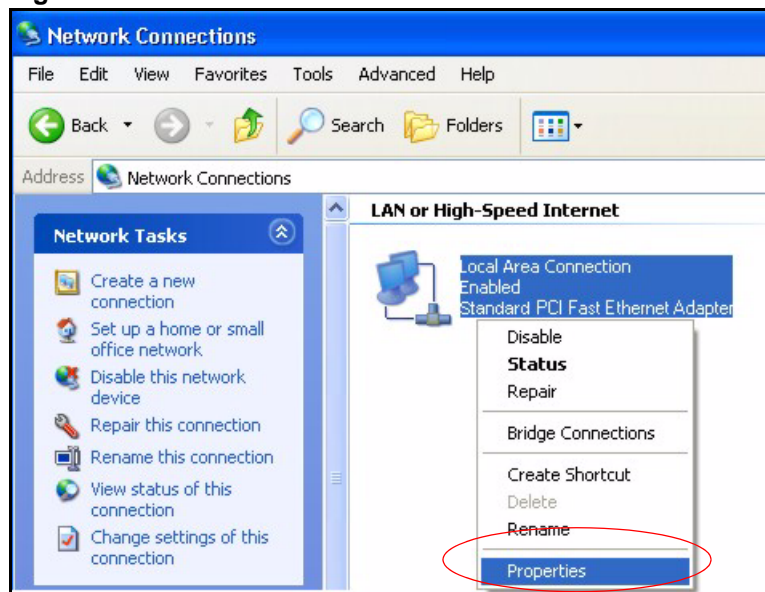
4 Select **Internet Protocol (TCP/IP)** (under the **General** tab in Win XP) and then click **Properties**.

Figure 52 Windows XP: Local Area Connection Properties
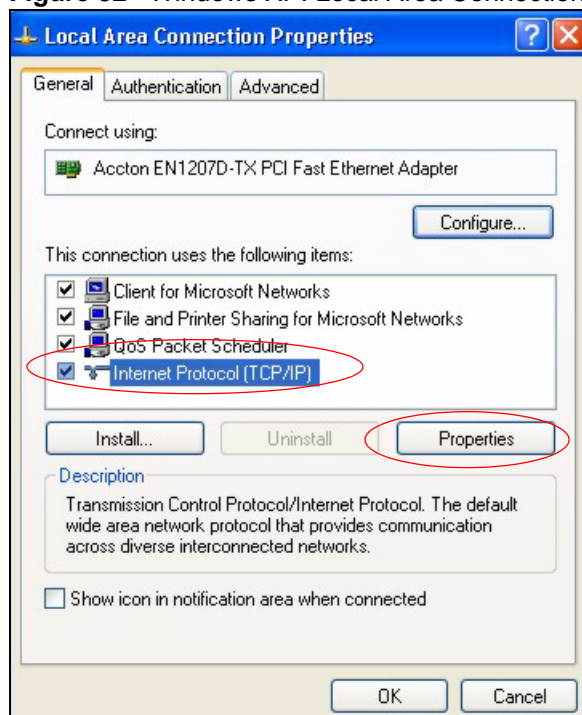
5 The **Internet Protocol TCP/IP Properties** window opens (the **General tab** in Windows XP).

- If you have a dynamic IP address click **Obtain an IP address automatically**.
- If you have a static IP address click **Use the following IP Address** and fill in the **IP address**, **Subnet mask**, and **Default gateway** fields.
- Click **Advanced**.

Figure 53   Windows XP: Internet Protocol (TCP/IP) Properties

6   If you do not know your gateway's IP address, remove any previously installed gateways in the **IP Settings** tab and click **OK**.

Do one or more of the following if you want to configure additional IP addresses:

- In the **IP Settings** tab, in IP addresses, click **Add**.
- In **TCP/IP Address**, type an IP address in **IP address** and a subnet mask in **Subnet mask**, and then click **Add**.
- Repeat the above two steps for each IP address you want to add.
- Configure additional default gateways in the **IP Settings** tab by clicking **Add** in **Default gateways**.
- In **TCP/IP Gateway Address**, type the IP address of the default gateway in **Gateway**. To manually configure a default metric (the number of transmission hops), clear the **Automatic metric** check box and type a metric in **Metric**.
- Click **Add**.
- Repeat the previous three steps for each default gateway you want to add.
- Click **OK** when finished.

Figure 54   Windows XP: Advanced TCP/IP Properties
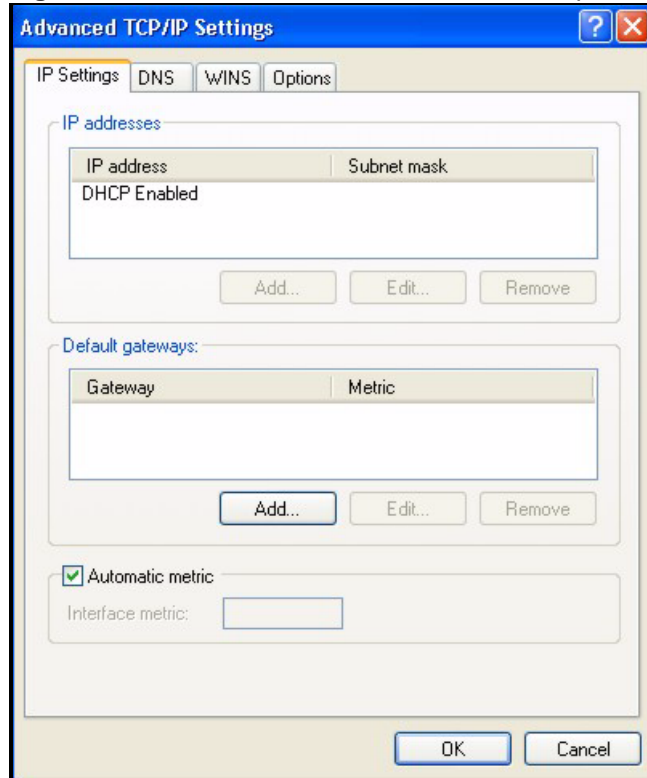
7 In the **Internet Protocol TCP/IP Properties** window (the **General** tab in Windows XP):

- Click **Obtain DNS server address automatically** if you do not know your DNS server IP address(es).
- If you know your DNS server IP address(es), click **Use the following DNS server addresses**, and type them in the **Preferred DNS server** and **Alternate DNS server** fields.

   If you have previously configured DNS servers, click **Advanced** and then the **DNS** tab to order them.

Figure 55   Windows XP: Internet Protocol (TCP/IP) Properties
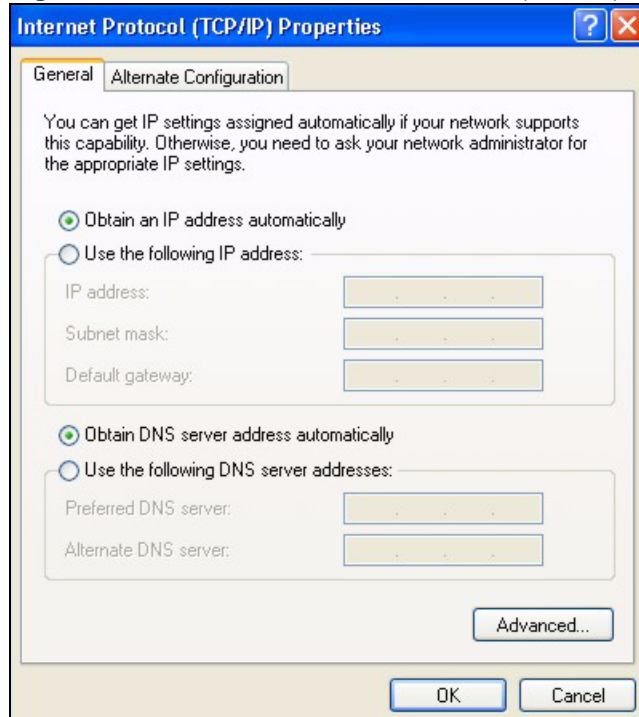
8   Click **OK** to close the **Internet Protocol (TCP/IP) Properties** window.

9   Click **Close** (**OK** in Windows 2000/NT) to close the **Local Area Connection Properties** window.

10   Close the **Network Connections** window (**Network and Dial-up Connections** in Windows 2000/NT).

11   Turn on your DMA and restart your computer (if prompted).

Verifying Settings

1   Click **Start**, **All Programs**, **Accessories** and then **Command Prompt**.

2   In the **Command Prompt** window, type "ipconfig" and then press [ENTER]. You can also open **Network Connections**, right-click a network connection, click **Status** and then click the **Support** tab.

Windows Vista

This section shows screens from Windows Vista Enterprise Version 6.0.

1   Click the **Start** icon, **Control Panel**.

Figure 56   Windows Vista: Start Menu
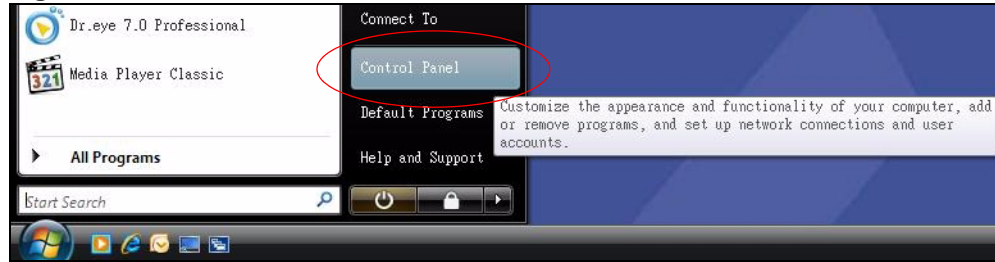
2   In the **Control Panel**, double-click **Network and Internet**.

Figure 57   Windows Vista: Control Panel
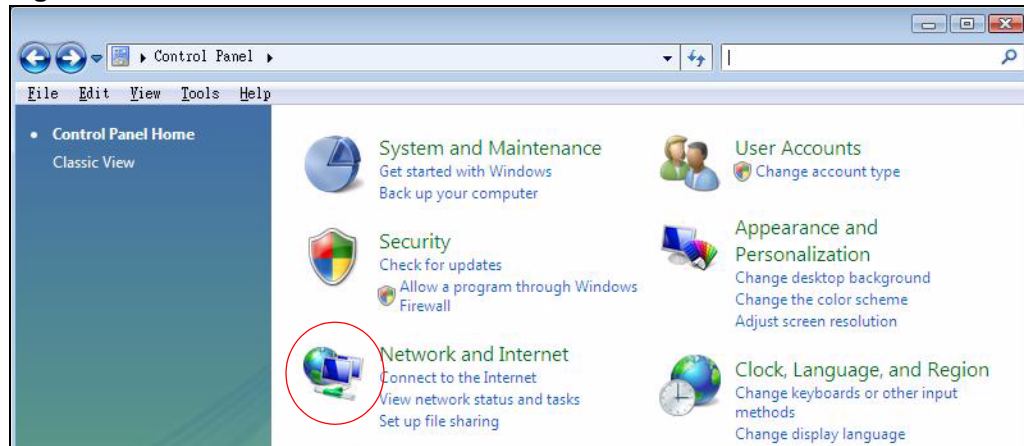
3   Click **Network and Sharing Center**.

Figure 58   Windows Vista: Network And Internet
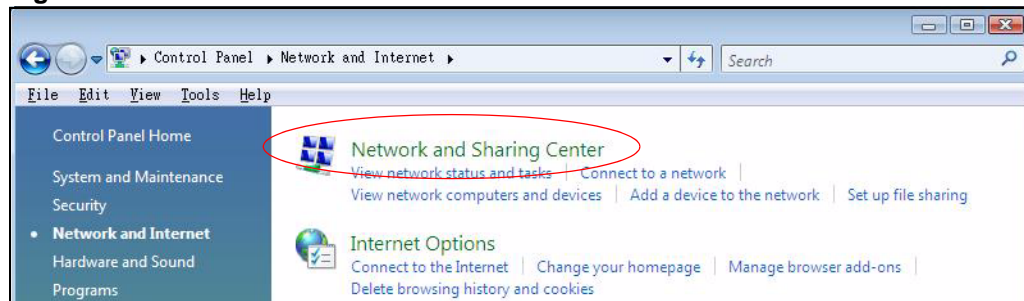
4   Click **Manage network connections**.

Figure 59   Windows Vista: Network and Sharing Center
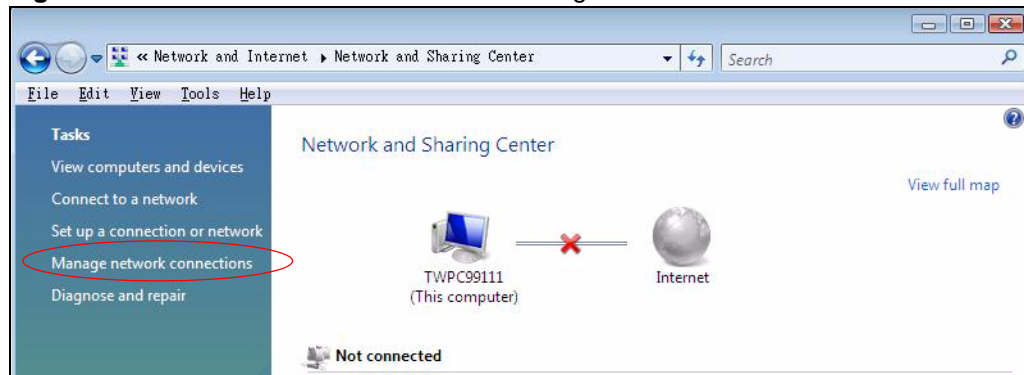
5 Right-click **Local Area Connection** and then click **Properties**.

✎ During this procedure, click **Continue** whenever Windows displays a screen saying that it needs your permission to continue.

Figure 60 Windows Vista: Network and Sharing Center
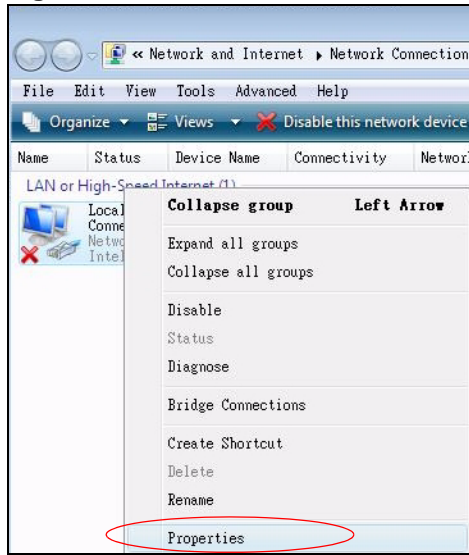
6 Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.

Figure 61 Windows Vista: Local Area Connection Properties
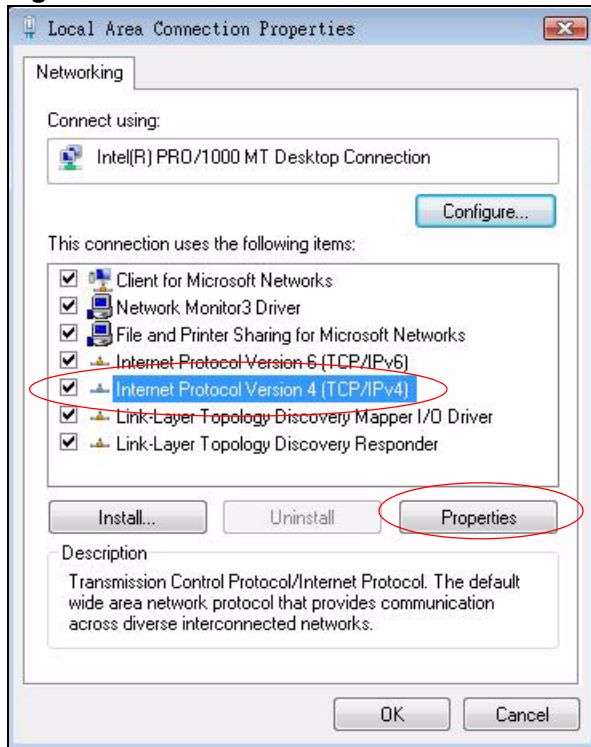
7 The **Internet Protocol Version 4 (TCP/IPv4) Properties** window opens (the **General tab**).

- If you have a dynamic IP address click **Obtain an IP address automatically**.
- If you have a static IP address click **Use the following IP address** and fill in the **IP address**, **Subnet mask**, and **Default gateway** fields.
- Click **Advanced**.

Figure 62 Windows Vista: Internet Protocol Version 4 (TCP/IPv4) Properties

8 If you do not know your gateway's IP address, remove any previously installed gateways in the **IP Settings** tab and click **OK**.

Do one or more of the following if you want to configure additional IP addresses:

- In the **IP Settings** tab, in IP addresses, click **Add**.
- In **TCP/IP Address**, type an IP address in **IP address** and a subnet mask in **Subnet mask**, and then click **Add**.
- Repeat the above two steps for each IP address you want to add.
- Configure additional default gateways in the **IP Settings** tab by clicking **Add** in **Default gateways**.
- In **TCP/IP Gateway Address**, type the IP address of the default gateway in **Gateway**. To manually configure a default metric (the number of transmission hops), clear the **Automatic metric** check box and type a metric in **Metric**.
- Click **Add**.
- Repeat the previous three steps for each default gateway you want to add.
- Click **OK** when finished.

Figure 63 Windows Vista: Advanced TCP/IP Properties
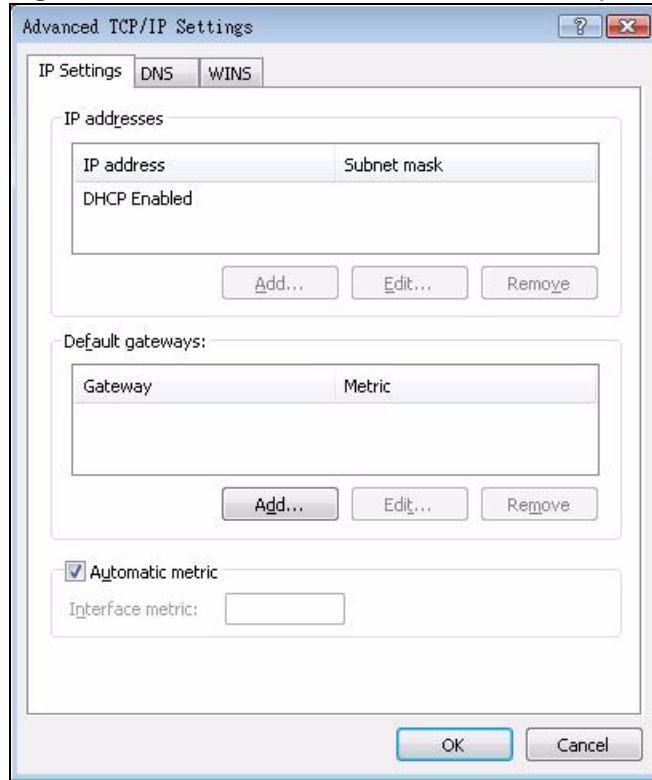
9 In the **Internet Protocol Version 4 (TCP/IPv4) Properties** window, (the **General tab**):
- Click **Obtain DNS server address automatically** if you do not know your DNS server IP address(es).
- If you know your DNS server IP address(es), click **Use the following DNS server addresses**, and type them in the **Preferred DNS server** and **Alternate DNS server** fields.

  If you have previously configured DNS servers, click **Advanced** and then the **DNS** tab to order them.

Figure 64   Windows Vista: Internet Protocol Version 4 (TCP/IPv4) Properties
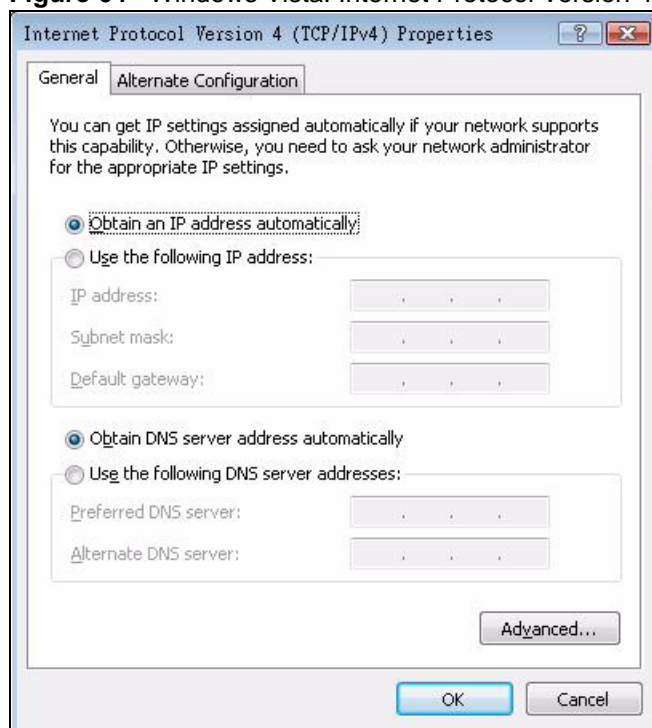
10 Click **OK** to close the **Internet Protocol Version 4 (TCP/IPv4) Properties** window.

11 Click **Close** to close the **Local Area Connection Properties** window.

12 Close the **Network Connections** window.

13 Turn on your DMA and restart your computer (if prompted).

Verifying Settings

1   Click **Start**, **All Programs**, **Accessories** and then **Command Prompt**.

2   In the **Command Prompt** window, type "ipconfig" and then press [ENTER]. You can also open **Network Connections**, right-click a network connection, click **Status** and then click the **Support** tab.

Macintosh OS 8/9

1   Click the **Apple** menu, **Control Panel** and double-click **TCP/IP** to open the **TCP/IP Control Panel**.

Figure 65 Macintosh OS 8/9: Apple Menu
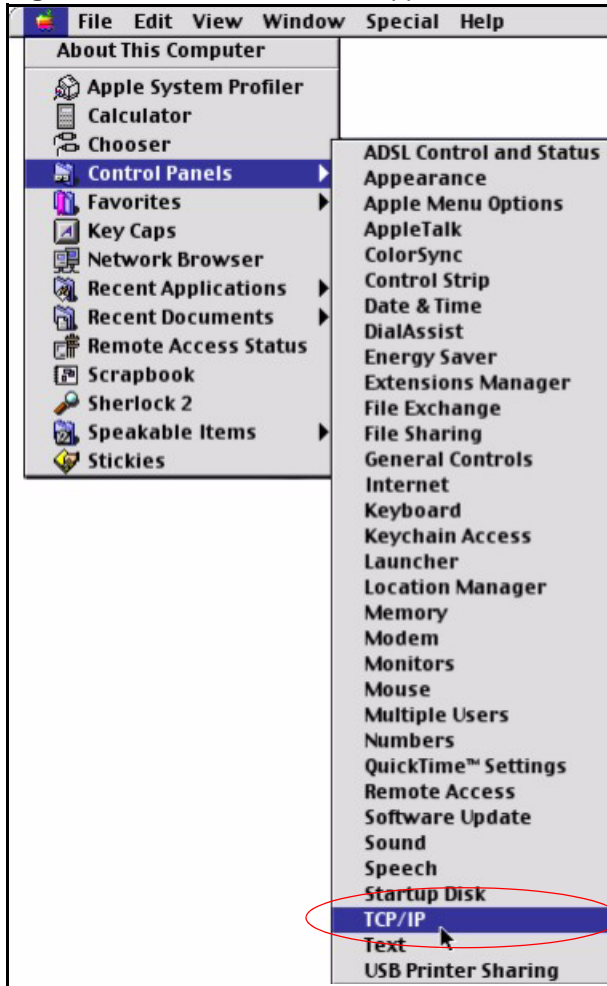
2 Select **Ethernet built-in** from the **Connect via** list.

Figure 66 Macintosh OS 8/9: TCP/IP
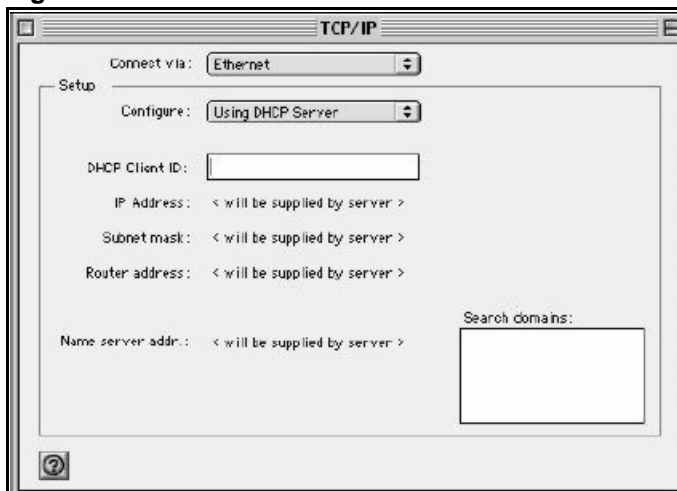
3 For dynamically assigned settings, select **Using DHCP Server** from the **Configure:** list.

4 For statically assigned settings, do the following:
- From the **Configure** box, select **Manually**.

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- Type your IP address in the **IP Address** box.
- Type your subnet mask in the **Subnet mask** box.
- Type the IP address of your DMA in the **Router address** box.

5 Close the **TCP/IP Control Panel**.

6 Click **Save** if prompted, to save changes to your configuration.

7 Turn on your DMA and restart your computer (if prompted).

Verifying Settings

Check your TCP/IP properties in the **TCP/IP Control Panel** window.

Macintosh OS X

1 Click the **Apple** menu, and click **System Preferences** to open the **System Preferences** window.

Figure 67 Macintosh OS X: Apple Menu
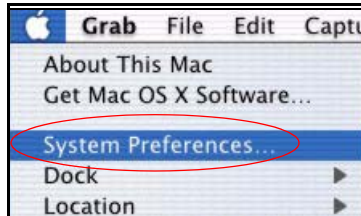
2 Click **Network** in the icon bar.
- Select **Automatic** from the **Location** list.
- Select **Built-in Ethernet** from the **Show** list.
- Click the **TCP/IP** tab.

3 For dynamically assigned settings, select **Using DHCP** from the **Configure** list.

Figure 68 Macintosh OS X: Network
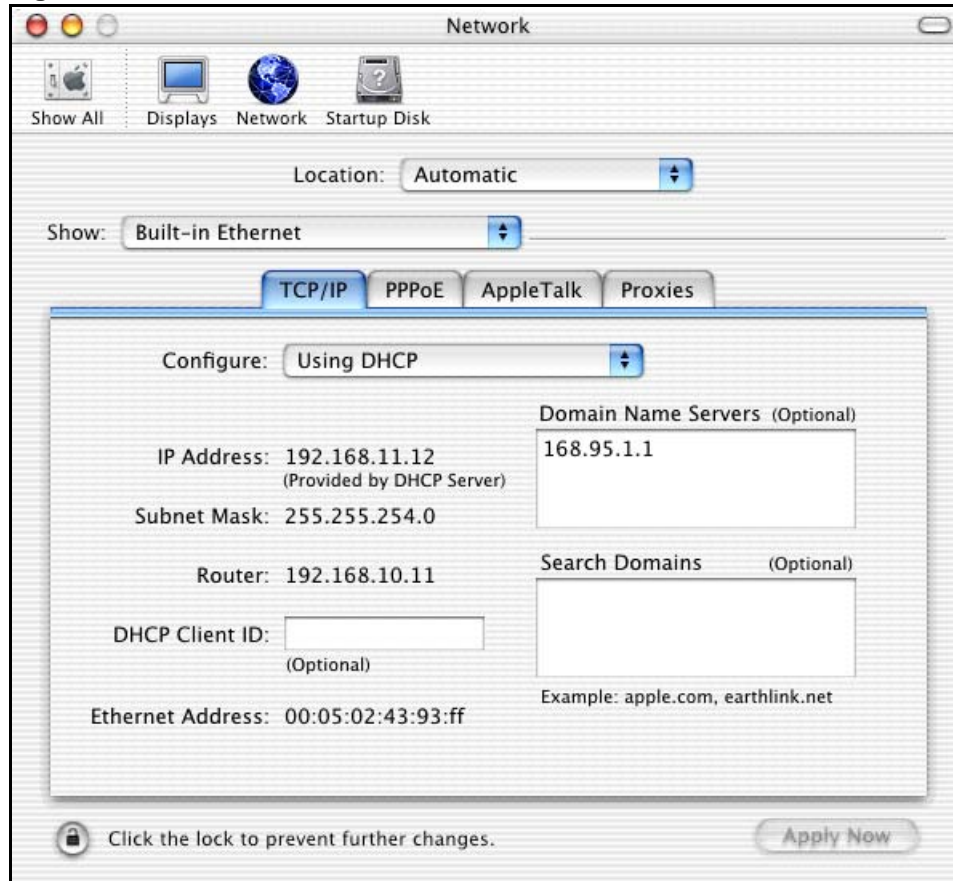
4 For statically assigned settings, do the following:
   • From the **Configure** box, select **Manually**.
   • Type your IP address in the **IP Address** box.
   • Type your subnet mask in the **Subnet mask** box.
   • Type the IP address of your DMA in the **Router address** box.
5 Click **Apply Now** and close the window.
6 Turn on your DMA and restart your computer (if prompted).

Verifying Settings

Check your TCP/IP properties in the **Network** window.

Linux

This section shows you how to configure your computer's TCP/IP settings in Red Hat Linux 9.0. Procedure, screens and file location may vary depending on your Linux distribution and release version.

✍   Make sure you are logged in as the root administrator.

Using the K Desktop Environment (KDE)

Follow the steps below to configure your computer IP address using the KDE.

1 Click the Red Hat button (located on the bottom left corner), select **System Setting** and click **Network**.

Figure 69   Red Hat 9.0: KDE: Network Configuration: Devices
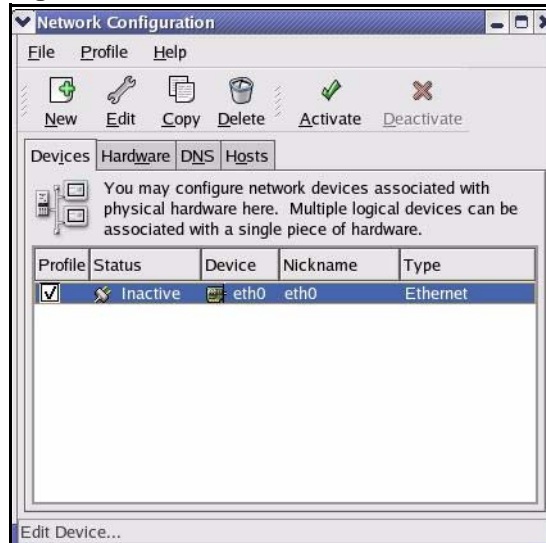
2 Double-click on the profile of the network card you wish to configure. The **Ethernet Device General** screen displays as shown.

Figure 70   Red Hat 9.0: KDE: Ethernet Device: General

- If you have a dynamic IP address, click **Automatically obtain IP address settings with** and select **dhcp** from the drop down list.
- If you have a static IP address, click **Statically set IP Addresses** and fill in the **Address**, **Subnet mask**, and **Default Gateway Address** fields.

3 Click **OK** to save the changes and close the **Ethernet Device General** screen.

4 If you know your DNS server IP address(es), click the **DNS** tab in the **Network Configuration** screen. Enter the DNS server information in the fields provided.

Figure 71 Red Hat 9.0: KDE: Network Configuration: DNS
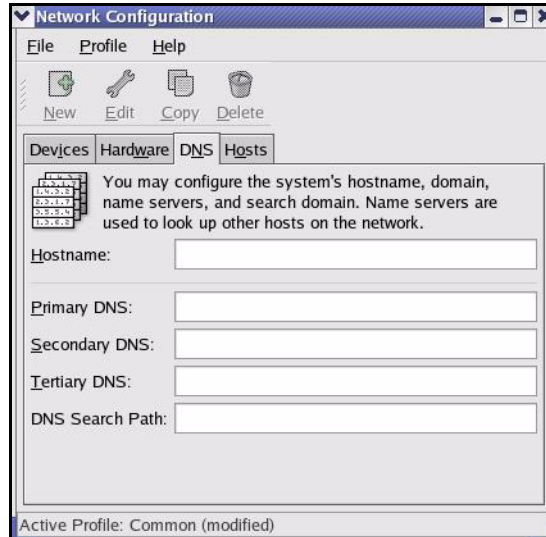
5 Click the **Devices** tab.

6 Click the **Activate** button to apply the changes. The following screen displays. Click **Yes to save the changes in all screens.**

Figure 72 Red Hat 9.0: KDE: Network Configuration: Activate
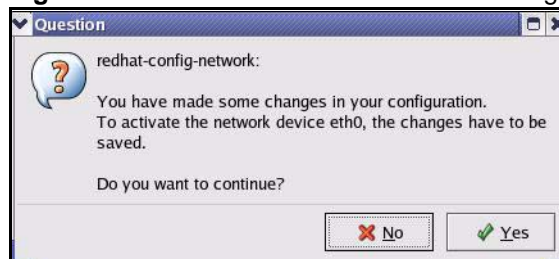
7 After the network card restart process is complete, make sure the **Status** is **Active** in the **Network Configuration** screen.

Using Configuration Files

Follow the steps below to edit the network configuration files and set your computer IP address.

1 Assuming that you have only one network card on the computer, locate the `ifconfig-eth0` configuration file (where `eth0` is the name of the Ethernet card). Open the configuration file with any plain text editor.

- If you have a dynamic IP address, enter **dhcp** in the `BOOTPROTO=` field. The following figure shows an example.

Figure 73   Red Hat 9.0: Dynamic IP Address Setting in ifconfig-eth0

```
DEVICE=eth0
ONBOOT=yes
BOOTPROTO=dhcp
USERCTL=no
PEERDNS=yes
TYPE=Ethernet
```

- If you have a static IP address, enter **static** in the BOOTPROTO= field. Type IPADDR= followed by the IP address (in dotted decimal notation) and type NETMASK= followed by the subnet mask. The following example shows an example where the static IP address is 192.168.1.10 and the subnet mask is 255.255.255.0.

Figure 74   Red Hat 9.0: Static IP Address Setting in ifconfig-eth0

```
DEVICE=eth0
ONBOOT=yes
BOOTPROTO=static
IPADDR=192.168.1.10
NETMASK=255.255.255.0
USERCTL=no
PEERDNS=yes
TYPE=Ethernet
```

2 If you know your DNS server IP address(es), enter the DNS server information in the resolv.conf file in the /etc directory. The following figure shows an example where two DNS server IP addresses are specified.

Figure 75   Red Hat 9.0: DNS Settings in resolv.conf

```
nameserver 172.23.5.1
nameserver 172.23.5.2
```

3 After you edit and save the configuration files, you must restart the network card. Enter ./network restart in the /etc/rc.d/init.d directory. The following figure shows an example.

Figure 76   Red Hat 9.0: Restart Ethernet Card

```
[root@localhost init.d]# network restart

Shutting down interface eth0:            [OK]
Shutting down loopback interface:        [OK]
Setting network parameters:              [OK]
Bringing up loopback interface:          [OK]
Bringing up interface eth0:              [OK]
```

Verifying Settings

Enter ifconfig in a terminal screen to check your TCP/IP properties.

Figure 77   Red Hat 9.0: Checking TCP/IP Properties

```
[root@localhost]# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:50:BA:72:5B:44
          inet addr:172.23.19.129  Bcast:172.23.19.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:717 errors:0 dropped:0 overruns:0 frame:0
          TX packets:13 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:100
          RX bytes:730412 (713.2 Kb)  TX bytes:1570 (1.5 Kb)
          Interrupt:10 Base address:0x1000
[root@localhost]#
```

D

Windows Vista Media Server

✍ This appendix is provided for your information only. The DMA is not Vista certified.

Playing Media Files From Your Windows Vista Computer

This appendix covers using the media server included in Windows Vista to let the DMA play media files on the computer. This way you do not need to install media server software. In the following figure, the DMA and your Windows Vista computer (**A**) are both connected to your home network.

Figure 78   DMA with Windows Vista Computer
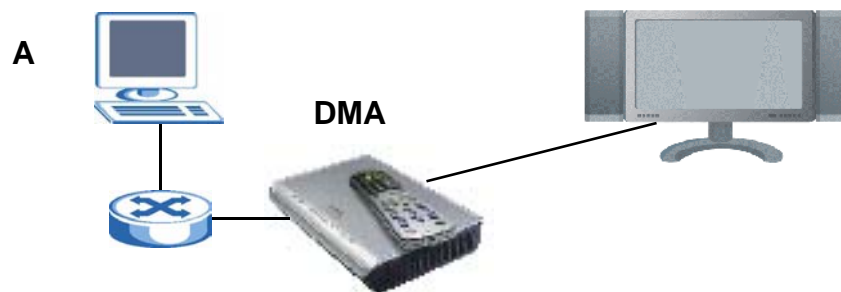
This appendix walks you through the following tasks:
* Starting the Windows Media Player
* Setting Your Computer to Trust Your Network
* Setting Your Computer to Share Files With the DMA
* Selecting Files to Share

Complete the sections in sequence. The DMA and the computer must be on the same home network (private LAN). This appendix shows screens from Windows Vista Enterprise Version 6.0.

Starting the Windows Media Player Network Sharing Service

If you are using Windows Vista, do the following to turn on the Windows Media Player.

1 Follow the Quick Start Guide Instructions to connect the DMA to your computer.

2 Right-click the **Computer** icon and click **Manage**.

✎ During this procedure, click Continue whenever Windows displays a screen saying that it needs your permission to continue.

3 In the following screen, click **Services and Applications** > **Services** > **Windows Media Player Network Sharing Service** > **Start**.

Figure 79 Start WIndows Media Player
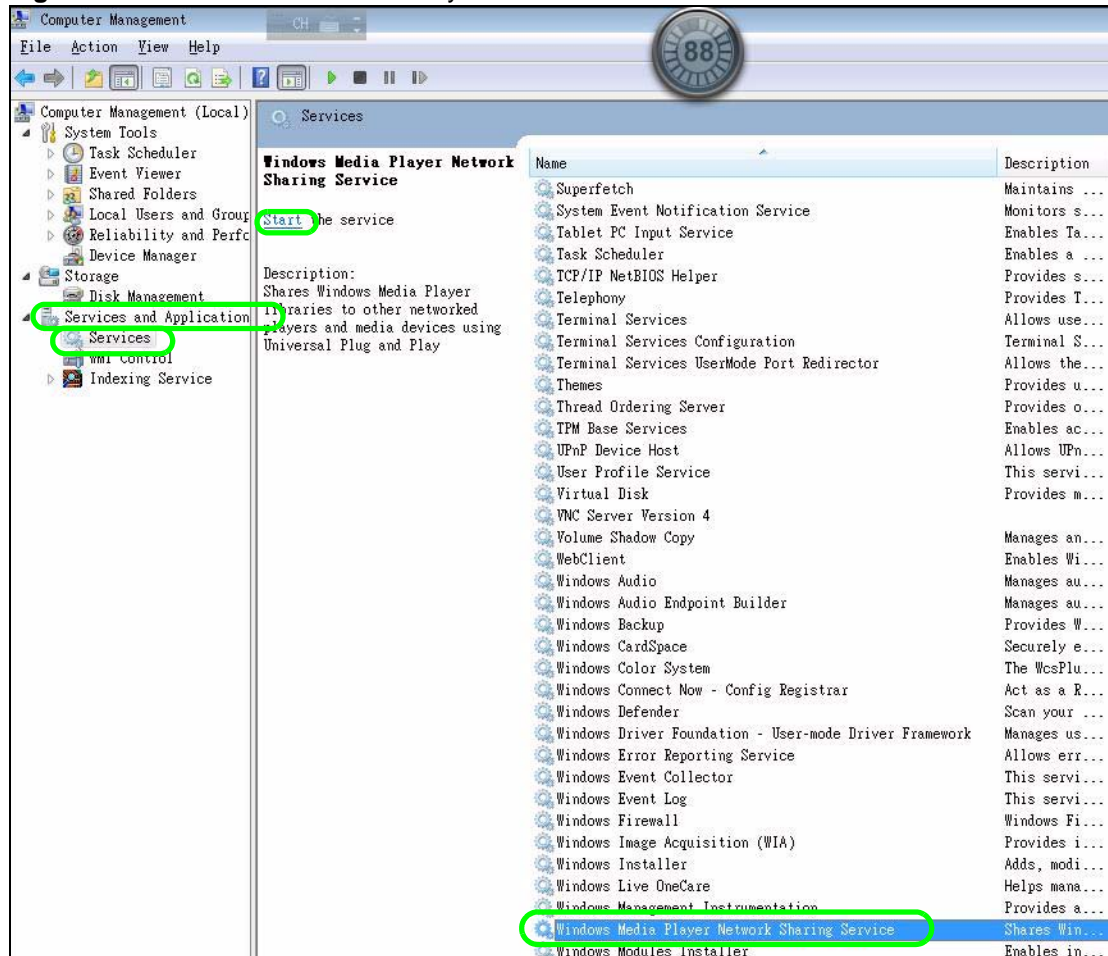
Setting Your Computer to Trust Your Network

The DMA and your computer are both on your home network, so you use this section to configure your computer to treat the network connection as a trusted private network. Make sure the DMA has a network connection to your computer before using this section.

1 Click the **Windows Media Player** icon in the system tray.

Figure 80 Start WIndows Media Player
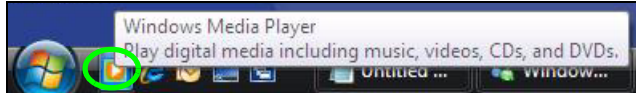
2 Right-click in the menu bar and click **Tools > Options**.

Figure 81 WIndows Media Player Tools> Options
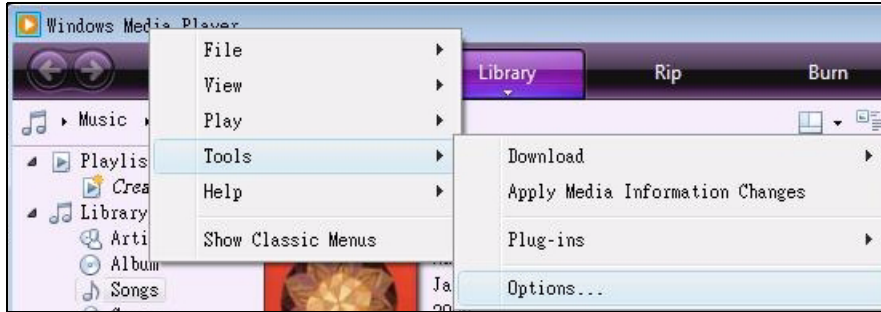
3 In the **Library** tab, click **Configure Sharing**.

Figure 82 Library

4 Click **Networking**.

Figure 83 Media Sharing
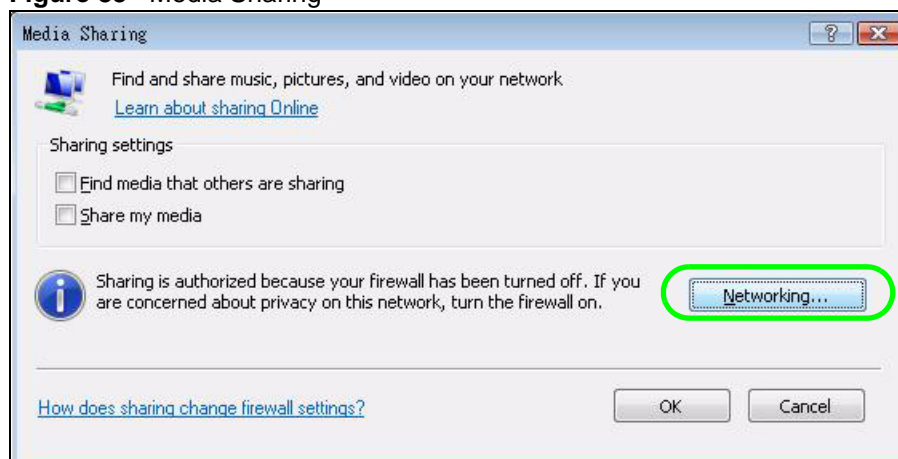
5 Windows searches for your network connections and displays them in the following window. Click **Customize**.

Figure 84 Network and Sharing Center

6 Select **Private** and click **Next** to have the computer trust the network connection to the DMA.

Figure 85 Set Network Location: Customize network settings
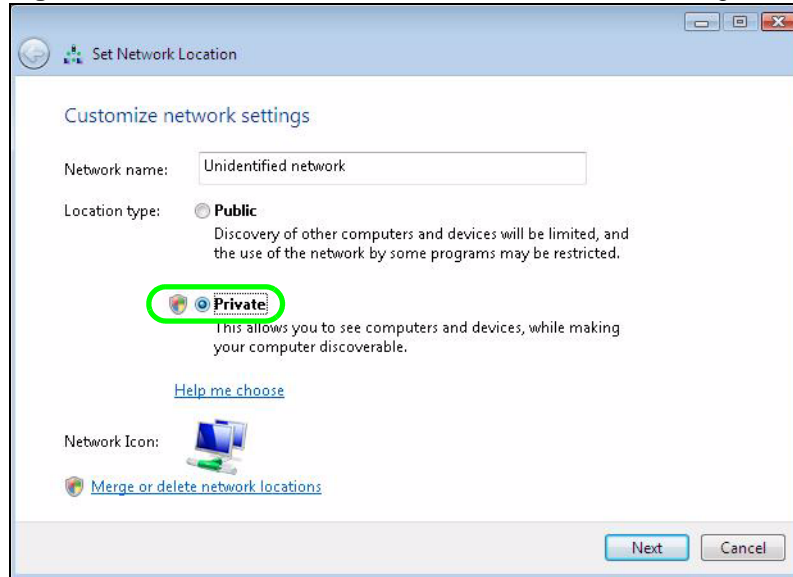
Setting Your Computer to Share Files With the DMA

This section covers how to set Windows Media Player to allow the DMA to play media files.

1 Click **View computers and devices on the network**.

Figure 86 Set Network Location: Successfully set network settings
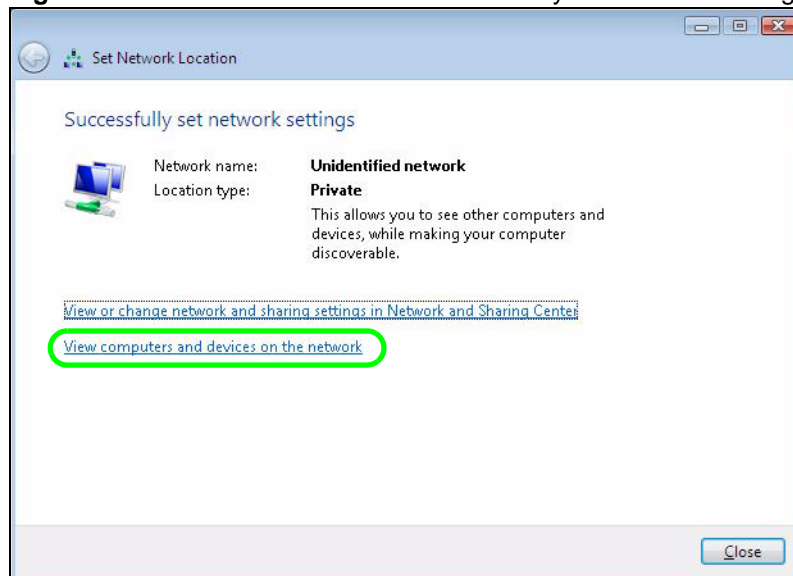
2 Right-click the DMA icon and click **Open Media Sharing**.

Figure 87 Network
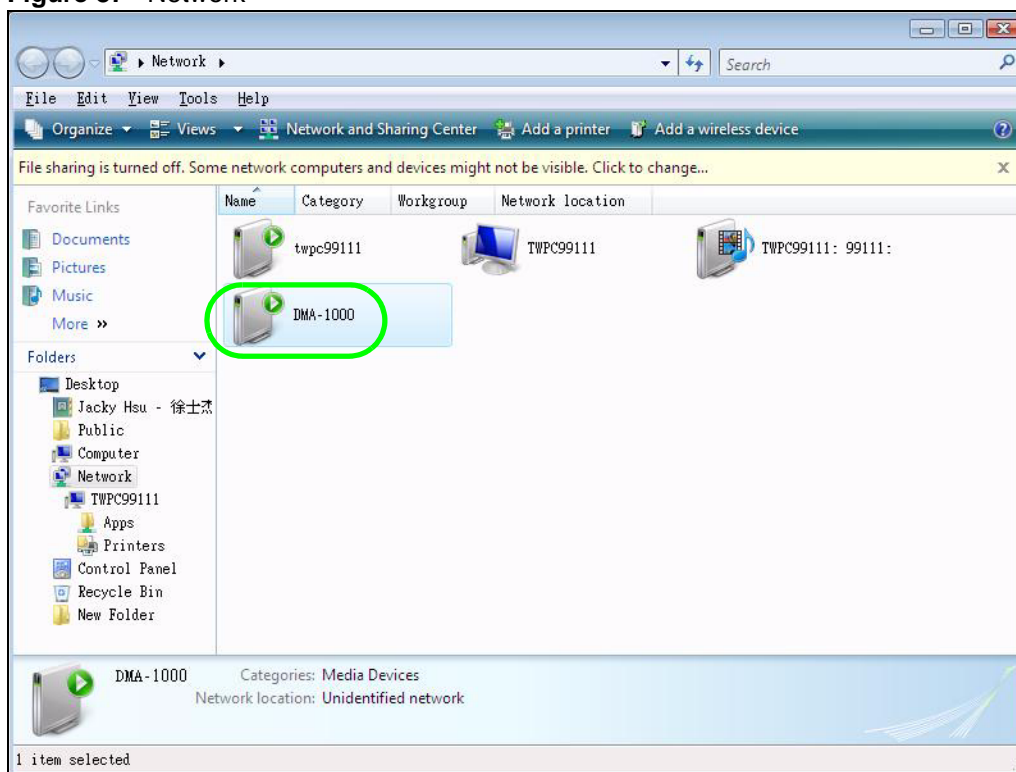
3 Select **Share my media** and click **OK**.

Figure 88 Media Sharing
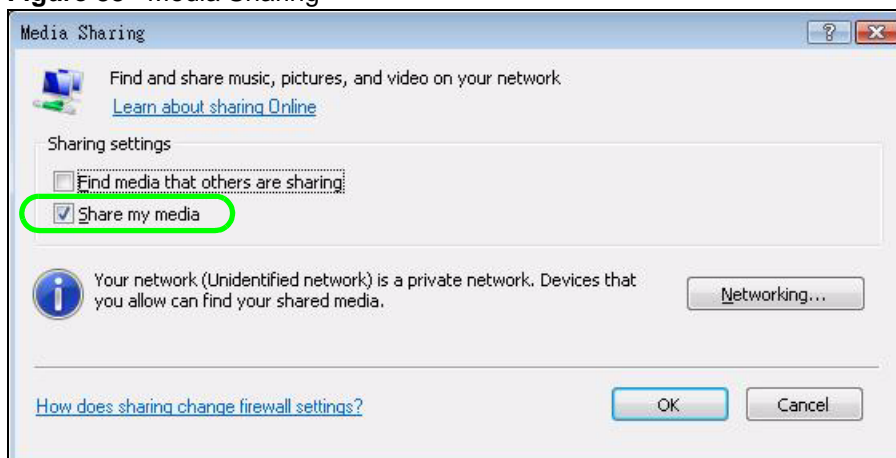
4 Identify the device that the computer should share media files with. Select the DMA icon and click **Allow > OK**.

Figure 89   Media Sharing: Select DMA
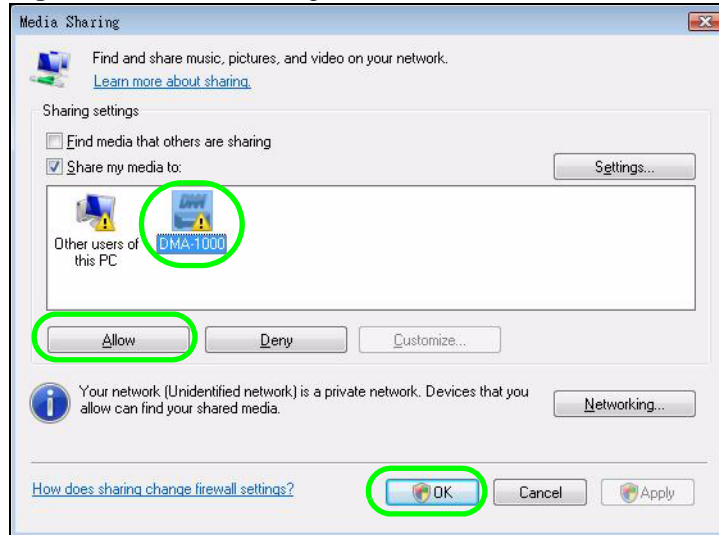
Selecting Files to Share

This section covers how to select the media files that the DMA is allowed to play.

1   In the **Library** tab, click **Monitor Folders**.

Figure 90   Library
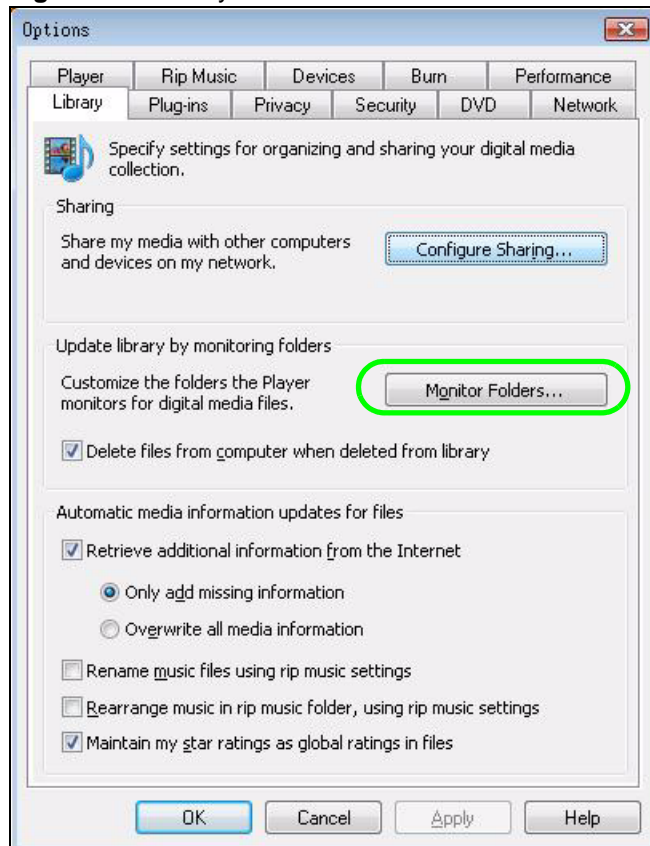
2   Click **Advanced Options**.

Figure 91 Add To Library
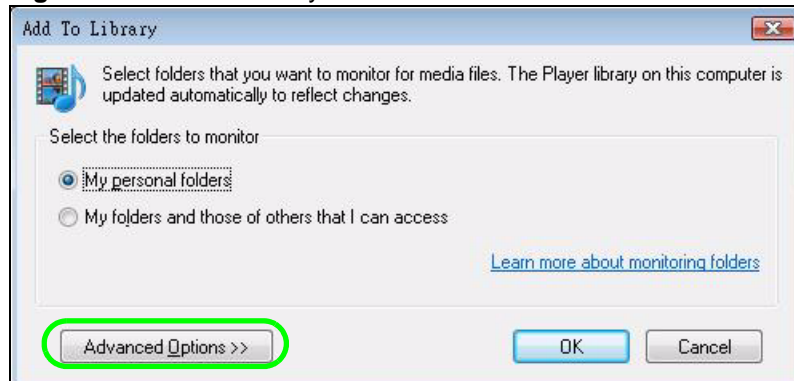
3 Select the folders to share and click **OK** when you are done.

Figure 92 Add To Library > Advanced
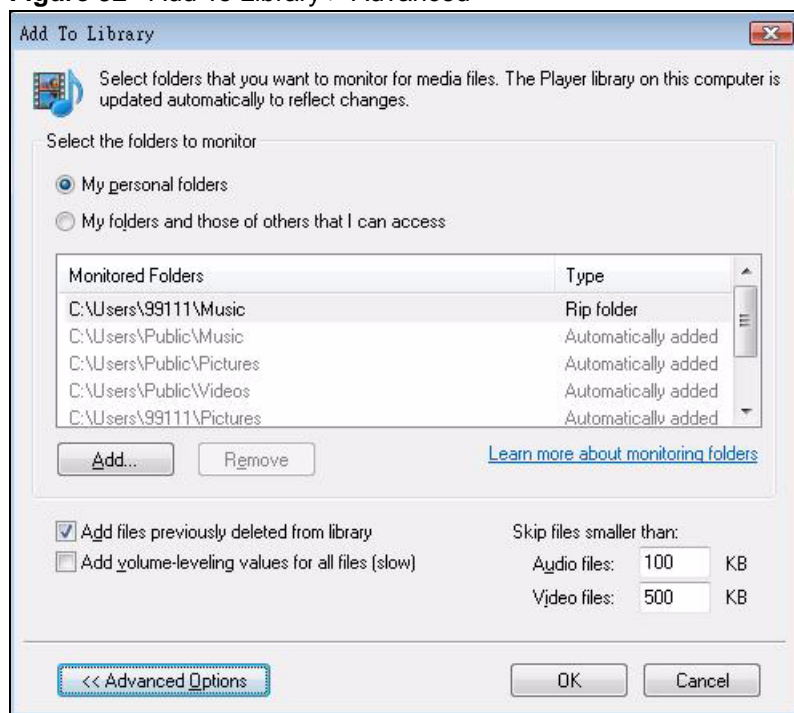
4 Click **OK** after the computer finds the files to share.

Figure 93 Add To Library Search
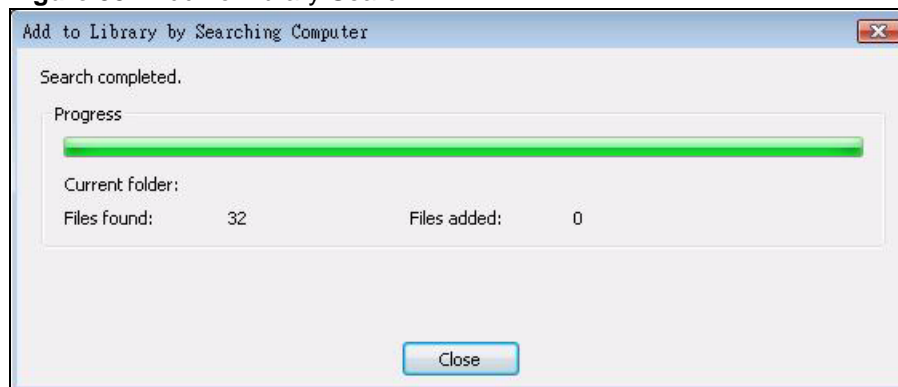
IP Addresses and Subnetting

This appendix introduces IP addresses and subnet masks.

IP addresses identify individual devices on a network. Every networking device (including computers, servers, routers, printers, etc.) needs an IP address to communicate across the network. These networking devices are also known as hosts.

Subnet masks determine the maximum number of possible hosts on a network. You can also use subnet masks to divide one network into multiple sub-networks.

Introduction to IP Addresses

One part of the IP address is the network number, and the other part is the host ID. In the same way that houses on a street share a common street name, the hosts on a network share a common network number. Similarly, as each house has its own house number, each host on the network has its own unique identifying number - the host ID. Routers use the network number to send packets to the correct network, while the host ID determines to which host on the network the packets are delivered.

Structure

An IP address is made up of four parts, written in dotted decimal notation (for example, 192.168.1.1). Each of these four parts is known as an octet. An octet is an eight-digit binary number (for example 11000000, which is 192 in decimal notation).

Therefore, each octet has a possible range of 00000000 to 11111111 in binary, or 0 to 255 in decimal.

The following figure shows an example IP address in which the first three octets (192.168.1) are the network number, and the fourth octet (16) is the host ID.

Figure 94 Network Number and Host ID
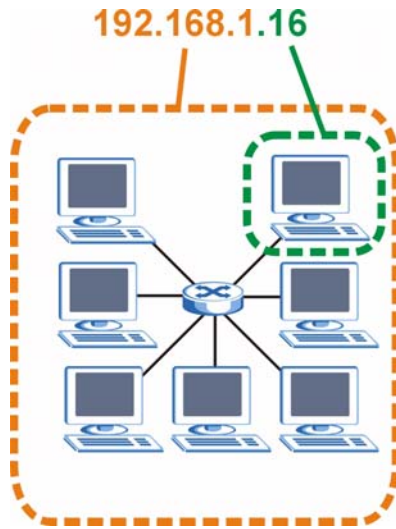
How much of the IP address is the network number and how much is the host ID varies according to the subnet mask.

Subnet Masks

A subnet mask is used to determine which bits are part of the network number, and which bits are part of the host ID (using a logical AND operation). The term "subnet" is short for "sub-network".

A subnet mask has 32 bits. If a bit in the subnet mask is a "1" then the corresponding bit in the IP address is part of the network number. If a bit in the subnet mask is "0" then the corresponding bit in the IP address is part of the host ID.

The following example shows a subnet mask identifying the network number (in bold text) and host ID of an IP address (192.168.1.2 in decimal).

Table 37 IP Address Network Number and Host ID Example

	1ST OCTET: (192)	2ND OCTET: (168)	3RD OCTET: (1)	4TH OCTET (2)
IP Address (Binary)	11000000	10101000	00000001	00000010
Subnet Mask (Binary)	**11111111**	**11111111**	**11111111**	00000000
Network Number	**11000000**	**10101000**	**00000001**	
Host ID				00000010

By convention, subnet masks always consist of a continuous sequence of ones beginning from the leftmost bit of the mask, followed by a continuous sequence of zeros, for a total number of 32 bits.

Subnet masks can be referred to by the size of the network number part (the bits with a "1" value). For example, an "8-bit mask" means that the first 8 bits of the mask are ones and the remaining 24 bits are zeroes.

Subnet masks are expressed in dotted decimal notation just like IP addresses. The following examples show the binary and decimal notation for 8-bit, 16-bit, 24-bit and 29-bit subnet masks.

Table 38 Subnet Masks

	BINARY				DECIMAL
	1ST OCTET	2ND OCTET	3RD OCTET	4TH OCTET	
8-bit mask	11111111	00000000	00000000	00000000	255.0.0.0
16-bit mask	11111111	11111111	00000000	00000000	255.255.0.0
24-bit mask	11111111	11111111	11111111	00000000	255.255.255.0
29-bit mask	11111111	11111111	11111111	11111000	255.255.255.248

Network Size

The size of the network number determines the maximum number of possible hosts you can have on your network. The larger the number of network number bits, the smaller the number of remaining host ID bits.

An IP address with host IDs of all zeros is the IP address of the network (192.168.1.0 with a 24-bit subnet mask, for example). An IP address with host IDs of all ones is the broadcast address for that network (192.168.1.255 with a 24-bit subnet mask, for example).

As these two IP addresses cannot be used for individual hosts, calculate the maximum number of possible hosts in a network as follows:

Table 39 Maximum Host Numbers

SUBNET MASK		HOST ID SIZE		MAXIMUM NUMBER OF HOSTS
8 bits	255.0.0.0	24 bits	$2^{24} - 2$	16777214
16 bits	255.255.0.0	16 bits	$2^{16} - 2$	65534
24 bits	255.255.255.0	8 bits	$2^{8} - 2$	254
29 bits	255.255.255.248	3 bits	$2^{3} - 2$	6

Notation

Since the mask is always a continuous number of ones beginning from the left, followed by a continuous number of zeros for the remainder of the 32 bit mask, you can simply specify the number of ones instead of writing the value of each octet. This is usually specified by writing a "/" followed by the number of bits in the mask after the address.

For example, 192.1.1.0 /25 is equivalent to saying 192.1.1.0 with subnet mask 255.255.255.128.

The following table shows some possible subnet masks using both notations.

Table 40 Alternative Subnet Mask Notation

SUBNET MASK	ALTERNATIVE NOTATION	LAST OCTET (BINARY)	LAST OCTET (DECIMAL)
255.255.255.0	/24	0000 0000	0
255.255.255.128	/25	1000 0000	128

Table 40   Alternative Subnet Mask Notation (continued)

SUBNET MASK	ALTERNATIVE NOTATION	LAST OCTET (BINARY)	LAST OCTET (DECIMAL)
255.255.255.192	/26	1100 0000	192
255.255.255.224	/27	1110 0000	224
255.255.255.240	/28	1111 0000	240
255.255.255.248	/29	1111 1000	248
255.255.255.252	/30	1111 1100	252

Subnetting

You can use subnetting to divide one network into multiple sub-networks. In the following example a network administrator creates two sub-networks to isolate a group of servers from the rest of the company network for security reasons.

In this example, the company network address is 192.168.1.0. The first three octets of the address (192.168.1) are the network number, and the remaining octet is the host ID, allowing a maximum of $2^8 - 2$ or 254 possible hosts.

The following figure shows the company network before subnetting.

Figure 95   Subnetting Example: Before Subnetting
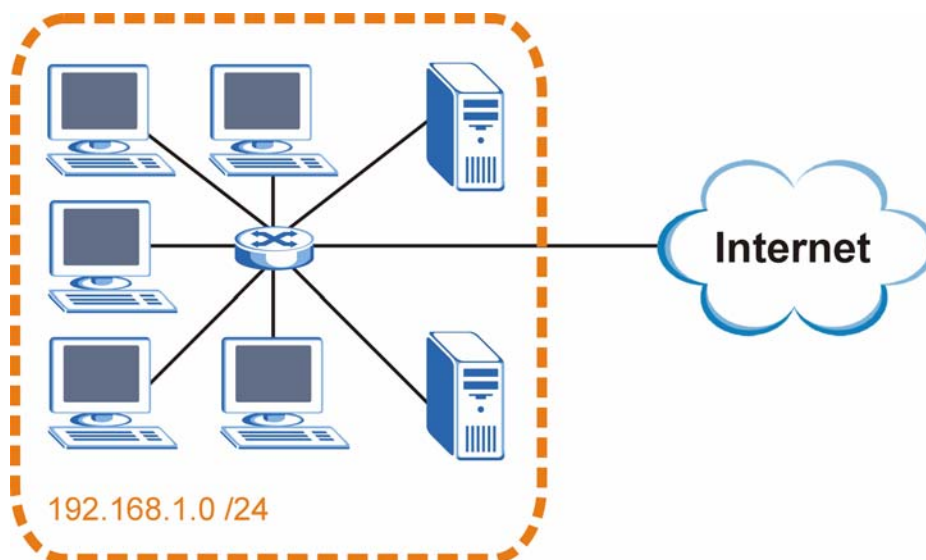
You can "borrow" one of the host ID bits to divide the network 192.168.1.0 into two separate sub-networks. The subnet mask is now 25 bits (255.255.255.128 or /25).

The "borrowed" host ID bit can have a value of either 0 or 1, allowing two subnets; 192.168.1.0 /25 and 192.168.1.128 /25.

The following figure shows the company network after subnetting. There are now two sub-networks, **A** and **B**.

Figure 96 Subnetting Example: After Subnetting
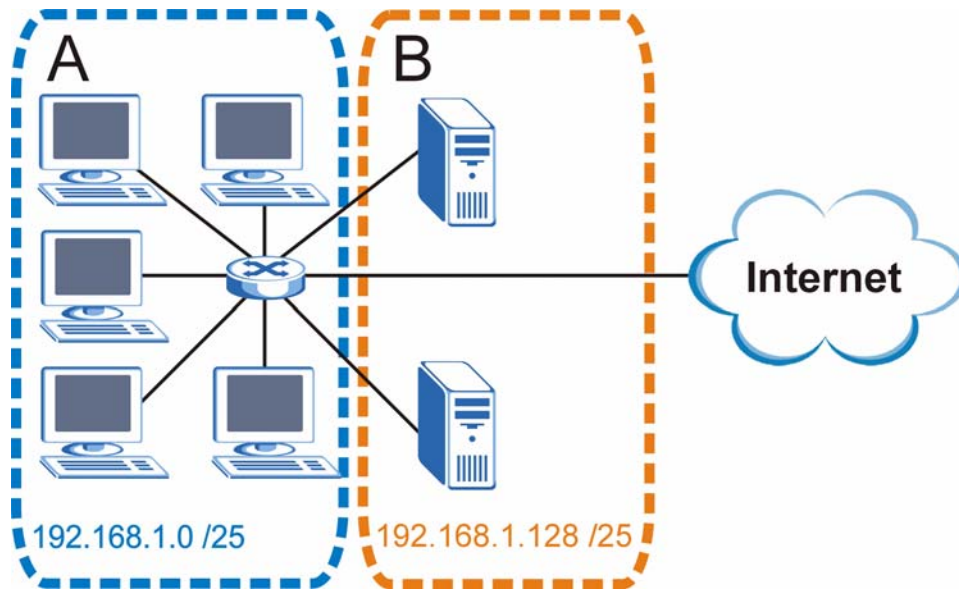
In a 25-bit subnet the host ID has 7 bits, so each sub-network has a maximum of $2^7 - 2$ or 126 possible hosts (a host ID of all zeroes is the subnet's address itself, all ones is the subnet's broadcast address).

192.168.1.0 with mask 255.255.255.128 is subnet **A** itself, and 192.168.1.127 with mask 255.255.255.128 is its broadcast address. Therefore, the lowest IP address that can be assigned to an actual host for subnet **A** is 192.168.1.1 and the highest is 192.168.1.126.

Similarly, the host ID range for subnet **B** is 192.168.1.129 to 192.168.1.254.

Example: Four Subnets

The previous example illustrated using a 25-bit subnet mask to divide a 24-bit address into two subnets. Similarly, to divide a 24-bit address into four subnets, you need to "borrow" two host ID bits to give four possible combinations (00, 01, 10 and 11). The subnet mask is 26 bits (11111111.11111111.11111111.**11**000000) or 255.255.255.192.

Each subnet contains 6 host ID bits, giving 2^6 - 2 or 62 hosts for each subnet (a host ID of all zeroes is the subnet itself, all ones is the subnet's broadcast address).

Table 41 Subnet 1

IP/SUBNET MASK	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address (Decimal)	192.168.1.	0
IP Address (Binary)	11000000.10101000.00000001.	**00**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.0	Lowest Host ID: 192.168.1.1	
Broadcast Address: 192.168.1.63	Highest Host ID: 192.168.1.62	

Table 42 Subnet 2

IP/SUBNET MASK	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	64
IP Address (Binary)	11000000.10101000.00000001.	**01**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.64	Lowest Host ID: 192.168.1.65	
Broadcast Address: 192.168.1.127	Highest Host ID: 192.168.1.126	

Table 43 Subnet 3

IP/SUBNET MASK	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	128
IP Address (Binary)	11000000.10101000.00000001.	**10**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.128	Lowest Host ID: 192.168.1.129	
Broadcast Address: 192.168.1.191	Highest Host ID: 192.168.1.190	

Table 44 Subnet 4

IP/SUBNET MASK	NETWORK NUMBER	LAST OCTET BIT VALUE
IP Address	192.168.1.	192
IP Address (Binary)	11000000.10101000.00000001.	**11**000000
Subnet Mask (Binary)	11111111.11111111.11111111.	**11**000000
Subnet Address: 192.168.1.192	Lowest Host ID: 192.168.1.193	
Broadcast Address: 192.168.1.255	Highest Host ID: 192.168.1.254	

Example: Eight Subnets

Similarly, use a 27-bit mask to create eight subnets (000, 001, 010, 011, 100, 101, 110 and 111).

The following table shows IP address last octet values for each subnet.

Table 45 Eight Subnets

SUBNET	SUBNET ADDRESS	FIRST ADDRESS	LAST ADDRESS	BROADCAST ADDRESS
1	0	1	30	31
2	32	33	62	63
3	64	65	94	95
4	96	97	126	127

Table 45 Eight Subnets (continued)

SUBNET	SUBNET ADDRESS	FIRST ADDRESS	LAST ADDRESS	BROADCAST ADDRESS
5	128	129	158	159
6	160	161	190	191
7	192	193	222	223
8	224	225	254	255

Subnet Planning

The following table is a summary for subnet planning on a network with a 24-bit network number.

Table 46 24-bit Network Number Subnet Planning

NO. "BORROWED" HOST BITS	SUBNET MASK	NO. SUBNETS	NO. HOSTS PER SUBNET
1	255.255.255.128 (/25)	2	126
2	255.255.255.192 (/26)	4	62
3	255.255.255.224 (/27)	8	30
4	255.255.255.240 (/28)	16	14
5	255.255.255.248 (/29)	32	6
6	255.255.255.252 (/30)	64	2
7	255.255.255.254 (/31)	128	1

The following table is a summary for subnet planning on a network with a 16-bit network number.

Table 47 16-bit Network Number Subnet Planning

NO. "BORROWED" HOST BITS	SUBNET MASK	NO. SUBNETS	NO. HOSTS PER SUBNET
1	255.255.128.0 (/17)	2	32766
2	255.255.192.0 (/18)	4	16382
3	255.255.224.0 (/19)	8	8190
4	255.255.240.0 (/20)	16	4094
5	255.255.248.0 (/21)	32	2046
6	255.255.252.0 (/22)	64	1022
7	255.255.254.0 (/23)	128	510
8	255.255.255.0 (/24)	256	254
9	255.255.255.128 (/25)	512	126
10	255.255.255.192 (/26)	1024	62
11	255.255.255.224 (/27)	2048	30
12	255.255.255.240 (/28)	4096	14
13	255.255.255.248 (/29)	8192	6

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Table 47   16-bit Network Number Subnet Planning (continued)

NO. "BORROWED" HOST BITS	SUBNET MASK	NO. SUBNETS	NO. HOSTS PER SUBNET
14	255.255.255.252 (/30)	16384	2
15	255.255.255.254 (/31)	32768	1

Configuring IP Addresses

Where you obtain your network number depends on your particular situation. If the ISP or your network administrator assigns you a block of registered IP addresses, follow their instructions in selecting the IP addresses and the subnet mask.

If the ISP did not explicitly give you an IP network number, then most likely you have a single user account and the ISP will assign you a dynamic IP address when the connection is established. If this is the case, it is recommended that you select a network number from 192.168.0.0 to 192.168.255.0. The Internet Assigned Number Authority (IANA) reserved this block of addresses specifically for private use; please do not use any other number unless you are told otherwise. You must also enable Network Address Translation (NAT) on the DMA.

Once you have decided on the network number, pick an IP address for your DMA that is easy to remember (for instance, 192.168.1.1) but make sure that no other device on your network is using that IP address.

The subnet mask specifies the network number portion of an IP address. Your DMA will compute the subnet mask automatically based on the IP address that you entered. You don't need to change the subnet mask computed by the DMA unless you are instructed to do otherwise.

Private IP Addresses

Every machine on the Internet must have a unique address. If your networks are isolated from the Internet (running only between two branch offices, for example) you can assign any IP addresses to the hosts without problems. However, the Internet Assigned Numbers Authority (IANA) has reserved the following three blocks of IP addresses specifically for private networks:

- 10.0.0.0   — 10.255.255.255
- 172.16.0.0   — 172.31.255.255
- 192.168.0.0 — 192.168.255.255

You can obtain your IP address from the IANA, from an ISP, or it can be assigned from a private network. If you belong to a small organization and your Internet access is through an ISP, the ISP can provide you with the Internet addresses for your local networks. On the other hand, if you are part of a much larger organization, you should consult your network administrator for the appropriate IP addresses.

Regardless of your particular situation, do not create an arbitrary IP address; always follow the guidelines above. For more information on address assignment, please refer to RFC 1597, Address Allocation for Private Internets and RFC 1466, Guidelines for Management of IP Address Space.

IP Address Conflicts

Each device on a network must have a unique IP address. Devices with duplicate IP addresses on the same network will not be able to access the Internet or other resources. The devices may also be unreachable through the network.

Conflicting Computer IP Addresses Example

More than one device can not use the same IP address. In the following example computer **A** has a static (or fixed) IP address that is the same as the IP address that a DHCP server assigns to computer **B** which is a DHCP client. Neither can access the Internet. This problem can be solved by assigning a different static IP address to computer **A** or setting computer **A** to obtain an IP address automatically.

Figure 97 Conflicting Computer IP Addresses Example
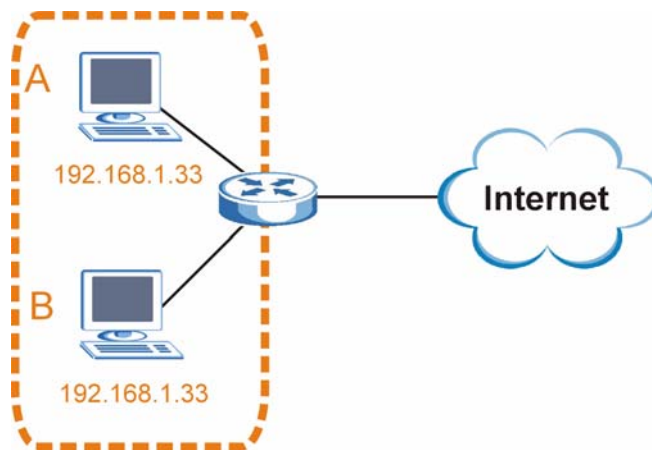
Conflicting Router IP Addresses Example

Since a router connects different networks, it must have interfaces using different network numbers. For example, if a router is set between a LAN and the Internet (WAN), the router's LAN and WAN addresses must be on different subnets. In the following example, the LAN and WAN are on the same subnet. The LAN computers cannot access the Internet because the router cannot route between networks.

Figure 98 Conflicting Computer IP Addresses Example
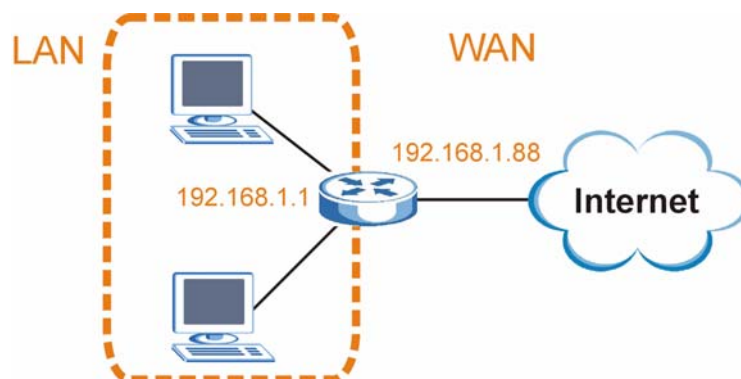
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Conflicting Computer and Router IP Addresses Example

More than one device can not use the same IP address. In the following example, the computer and the router's LAN port both use 192.168.1.1 as the IP address. The computer cannot access the Internet. This problem can be solved by assigning a different IP address to the computer or the router's LAN port.

Figure 99   Conflicting Computer and Router IP Addresses Example

F
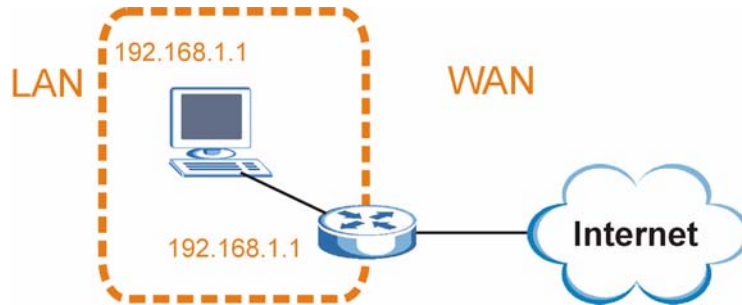
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original:
 busybox-1.00.tar.bz2

patch:
 busybox-1.00+autoip.060915.patch

*uCLinux 2.4.22
original:
 linux-2.4.22.tar.bz2
 uClinux-2.4.22-uc0.diff.bz2

patch:
 linux-2.4.22-patches.tar.bz2

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MRUA_src/rmlibhttp/src/common.c
MRUA_src/rmlibhttp/src/http.c
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MRUA_src/samples/Vera.ttf
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File located in MRUA_src/samples/VeraMono.ttf File located in bin/VeraMono.ttf

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UPnP Library:

MRUA_src/rmupnp/upnp_stack/_MediaServerControlPointStack/MmsCp.h MRUA_src/
rmupnp/upnp_stack/_MediaServerControlPointStack/MmsCp.c MRUA_src/rmupnp/
upnp_stack/_Utility/MyString.c

MRUA_src/rmupnp/upnp_stack/_Utility/MyString.h

MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/ILibSSDPClient.c
MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/ILibParsers.c
MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/ILibWebClient.h
MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/MSCP_ControlPoint.c
MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/ILibParsers.h
MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/ILibWebServer.c
MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/ILibWebServer.h
MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/ILibSSDPClient.h
MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/UPnPControlPointStructs.h
MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/BrowseOnly-Posix.upnpsg
MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/ILibAsyncServerSocket.h
MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/ILibWebClient.c
MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/ILibAsyncSocket.h
MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/ILibAsyncSocket.c
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MRUA_src/rmupnp/upnp_stack/_ControlPointCoreStack/MSCP_ControlPoint.h
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vfb.c

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*

* Authors and maintainers:

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* libpng versions 0.89c, June 1996, through 0.96, May 1997: Andreas Dilger

* libpng versions 0.97, January 1998, through 1.2.5 - October 3, 2002: Glenn

* See also "Contributing Authors", below.

*

* Note about libpng version numbers:

*

* Due to various miscommunications, unforeseen code incompatibilities

* and occasional factors outside the authors' control, version numbering

* on the library has not always been consistent and straightforward.

* The following table summarizes matters since version 0.89c, which was

* the first widely used release:

*

* source png.h png.h shared-lib

* version string int version

*

* 0.89c "1.0 beta 3" 0.89 89 1.0.89

* 0.90 "1.0 beta 4" 0.90 90 0.90 [should have been 2.0.90]

* 0.95 "1.0 beta 5" 0.95 95 0.95 [should have been 2.0.95]

* 0.96 "1.0 beta 6" 0.96 96 0.96 [should have been 2.0.96]

* 0.97b "1.00.97 beta 7" 1.00.97 97 1.0.1 [should have been 2.0.97]

* 0.97c 0.97 97 2.0.97

* 0.98 0.98 98 2.0.98

* 0.99 0.99 98 2.0.99

* 0.99a-m 0.99 99 2.0.99

* 1.00 1.00 100 2.1.0 [100 should be 10000]

* 1.0.0 (from here on, the 100 2.1.0 [100 should be 10000]

* 1.0.1 png.h string is 10001 2.1.0

* 1.0.1a-e identical to the 10002 from here on, the shared library

* 1.0.2 source version) 10002 is 2.V where V is the source code

* 1.0.2a-b 10003 version, except as noted.

* 1.0.3 10003

* 1.0.3a-d 10004

* 1.0.4 10004

* 1.0.4a-f 10005

* 1.0.5 (+ 2 patches) 10005

* 1.0.5a-d 10006

* 1.0.5e-r 10100 (not source compatible)

* 1.0.5s-v 10006 (not binary compatible)

* 1.0.6 (+ 3 patches) 10006 (still binary incompatible)

* 1.0.6d-f 10007 (still binary incompatible)

* 1.0.6g 10007

* 1.0.6h 10007 10.6h (testing xy.z so-numbering)

* 1.0.6i 10007 10.6i

* 1.0.6j 10007 2.1.0.6j (incompatible with 1.0.0)

* 1.0.7beta11-14 DLLNUM 10007 2.1.0.7beta11-14 (binary compatible)

* 1.0.7beta15-18 1 10007 2.1.0.7beta15-18 (binary compatible)

* 1.0.7rc1-2 1 10007 2.1.0.7rc1-2 (binary compatible)

* 1.0.7 1 10007 (still compatible)

* 1.0.8beta1-4 1 10008 2.1.0.8beta1-4

* 1.0.8rc1 1 10008 2.1.0.8rc1

* 1.0.8 1 10008 2.1.0.8

* 1.0.9beta1-6 1 10009 2.1.0.9beta1-6

* 1.0.9rc1 1 10009 2.1.0.9rc1

* 1.0.9beta7-10 1 10009 2.1.0.9beta7-10

* 1.0.9rc2 1 10009 2.1.0.9rc2

* 1.0.9 1 10009 2.1.0.9

* 1.0.10beta1 1 10010 2.1.0.10beta1

* 1.0.10rc1 1 10010 2.1.0.10rc1

* 1.0.10 1 10010 2.1.0.10

* 1.0.11beta1-3 1 10011 2.1.0.11beta1-3

* 1.0.11rc1 1 10011 2.1.0.11rc1

* 1.0.11 1 10011 2.1.0.11

* 1.0.12beta1-2 2 10012 2.1.0.12beta1-2

* 1.0.12rc1 2 10012 2.1.0.12rc1

* 1.0.12 2 10012 2.1.0.12

* 1.1.0a-f - 10100 2.1.1.0a-f (branch abandoned)

* 1.2.0beta1-2 2 10200 2.1.2.0beta1-2

* 1.2.0beta3-5 3 10200 3.1.2.0beta3-5

* 1.2.0rc1 3 10200 3.1.2.0rc1

* 1.2.0 3 10200 3.1.2.0

* 1.2.1beta1-4 3 10201 3.1.2.1beta1-4

* 1.2.1rc1-2 3 10201 3.1.2.1rc1-2

* 1.2.1 3 10201 3.1.2.1

* 1.2.2beta1-6 12 10202 12.so.0.1.2.2beta1-6

* 1.0.13beta1 10 10013 10.so.0.1.0.13beta1

* 1.0.13rc1 10 10013 10.so.0.1.0.13rc1

* 1.2.2rc1 12 10202 12.so.0.1.2.2rc1

* 1.0.13 10 10013 10.so.0.1.0.13

* 1.2.2 12 10202 12.so.0.1.2.2

* 1.2.3rc1-6 12 10203 12.so.0.1.2.3rc1-6

* 1.2.3 12 10203 12.so.0.1.2.3

* 1.2.4beta1-3 13 10204 12.so.0.1.2.4beta1-3

* 1.0.14rc1 13 10014 10.so.0.1.0.14rc1

* 1.2.4rc1 13 10204 12.so.0.1.2.4rc1

* 1.0.14 10 10014 10.so.0.1.0.14

* 1.2.4 13 10204 12.so.0.1.2.4

* 1.2.5beta1-2 13 10205 12.so.0.1.2.5beta1-2

* 1.0.15rc1-3 10 10015 10.so.0.1.0.15rc1-3

* 1.2.5rc1-3 13 10205 12.so.0.1.2.5rc1-3

* 1.0.15 10 10015 10.so.0.1.0.15

* 1.2.5 13 10205 12.so.0.1.2.5

*

* Henceforth the source version will match the shared-library major

* and minor numbers; the shared-library major version number will be

* used for changes in backward compatibility, as it is intended. The

* PNG_LIBPNG_VER macro, which is not used within libpng but is available

* for applications, is an unsigned integer of the form xyyzz corresponding

* to the source version x.y.z (leading zeros in y and z). Beta versions

* were given the previous public release number plus a letter, until

* version 1.0.6j; from then on they were given the upcoming public

* release number plus "betaNN" or "rcN".
*
* Binary incompatibility exists only when applications make direct access
* to the info_ptr or png_ptr members through png.h, and the compiled
* application is loaded with a different version of the library.
*
* DLLNUM will change each time there are forward or backward changes
* in binary compatibility (e.g., when a new feature is added).
*
* See libpng.txt or libpng.3 for more information. The PNG specification
* is available as RFC 2083 <ftp://ftp.uu.net/graphics/png/documents/>
* and as a W3C Recommendation <http://www.w3.org/TR/REC.png.html>
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/*

* A "png_get_copyright" function is available, for convenient use in "about" * boxes and the like:
*

* printf("%s",png_get_copyright(NULL));
*

* Also, the PNG logo (in PNG format, of course) is supplied in the
* files "pngbar.png" and "pngbar.jpg (88x31) and "pngnow.png" (98x31).
*/

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* The contributing authors would like to thank all those who helped * with testing, bug fixes, and patience. This wouldn't have been * possible without all of you.
*

* Thanks to Frank J. T. Wojcik for helping with the documentation.
*/
/*
* Y2K compliance in libpng:
* =========================
*
* October 3, 2002
*
* Since the PNG Development group is an ad-hoc body, we can't make
* an official declaration.
*
* This is your unofficial assurance that libpng from version 0.71 and
* upward through 1.2.5 are Y2K compliant. It is my belief that earlier
* versions were also Y2K compliant.
*
* Libpng only has three year fields. One is a 2-byte unsigned integer
* that will hold years up to 65535. The other two hold the date in text
* format, and will hold years up to 9999.
*
* The integer is
* "png_uint_16 year" in png_time_struct.
*
* The strings are
* "png_charp time_buffer" in png_struct and
* "near_time_buffer", which is a local character string in png.c.
*
* There are seven time-related functions:
* png.c: png_convert_to_rfc_1123() in png.c
* (formerly png_convert_to_rfc_1152() in error)
* png_convert_from_struct_tm() in pngwrite.c, called in pngwrite.c
* png_convert_from_time_t() in pngwrite.c
* png_get_tIME() in pngget.c
* png_handle_tIME() in pngrutil.c, called in pngread.c
* png_set_tIME() in pngset.c
* png_write_tIME() in pngwutil.c, called in pngwrite.c
*
* All handle dates properly in a Y2K environment. The

* png_convert_from_time_t() function calls gmtime() to convert from system

* clock time, which returns (year - 1900), which we properly convert to

* the full 4-digit year. There is a possibility that applications using

* libpng are not passing 4-digit years into the png_convert_to_rfc_1123()

* function, or that they are incorrectly passing only a 2-digit year

* instead of "year - 1900" into the png_convert_from_struct_tm() function,

* but this is not under our control. The libpng documentation has always

* stated that it works with 4-digit years, and the APIs have been

* documented as such.

*

* The tIME chunk itself is also Y2K compliant. It uses a 2-byte unsigned

* integer to hold the year, and can hold years as large as 65535.

*

* zlib, upon which libpng depends, is also Y2K compliant. It contains

* no date-related code.

*

* Glenn Randers-Pehrson

* libpng maintainer

* PNG Development Group

*/

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Tinyxml library:

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www.sourceforge.net/projects/tinyxml Original file by Yves Berquin.

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ARMUTILS Package

Software included with the ARM utilities package (as inferred from the list of Makefiles):

binutils:

binutils-2.11.2
GPL

ftp://sources.redhat.com/pub/binutils/releases

busybox:

149

busybox-1.00-pre3 and busybox-1.00
GPL

http://www.busybox.net/downloads

ccache:

ccache-2.3
GPL

http://ccache.samba.org/ftp/ccache/

cdrtools:

cdrtools-2.00.3
GPL

http://www.fokus.gmd.de/research/cc/glone/employees/jo erg.schilling/private/cdrecord.html

elf2flt:

elf2flt-20020214 and elf2flt-20030314
GPL

http://www.uclinux.org/pub/uClinux/utilities/

gcc:

gcc-2.95.3
GPL

http://gcc.gnu.org

ext2root:

genext2fs-1.3
GPL

http://packages.debian.org/unstable/admin/genext2fs

genromfs:

genromfs-0.5.1
GPL

http://www.uclinux.org/pub/uClinux/utilities/

linux:

linux-2.4.22
GPL

http://www.kernel.org/pub/linux/kernel/v2.4

uClinux-2.4.22-uc0

GPL

http://www.uclinux.org/pub/uClinux/uClinux-2.4.x

microwin:

microwindows-src-snapshot-013004

MPL (Mozilla Public License) -OR- GPL ftp://ftp.microwindows.org/pub/microwindows

madwifi:

madwifi-cvs20040331
Dual license:

a) Custom license - source redistribution OK - see
- OR -

b) GPL

http://madwifi.org/pub/linux/snapshot/tars

mtd:

mtd-20040901
GPL

ftp://ftp.uk.linux.org/pub/people/dwmw2/mtd/cvs

ncurses:

ncurses-5.2
GPL

http://ftp.gnu.org/pub/gnu/ncurses

openssl:

openssl-0.9.7d
Dual license:

a) OpenSSL license
- AND -

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The resulting license is a copyleft free software license (cf http://www.gnu.org/licenses/
license-list.html#OpenSSL)

http://www.openssl.org/source

prism54:

prism54-cvs20040318
GPL

http://prism54.org/pub/linux/snapshot/tars Software issue at http://www.prism54.org/software/

STLport:

STLport-4.5.3

Custom license - source redistribution OK - see

http://www.stlport.org/archive

tinylogin:

tinylogin-1.4

GPL -AND- Shadow utilities license (BSD-style) -PLUS- derived work from code licensed under the Eindhoven University of Technology license

http://tinylogin.busybox.net/downloads

uclibc:

uClibc-0.9.21 and uClibc-0.9.26
LGPL

http://www.uclibc.org/downloads

udhcp:

udhcp-0.9.8
GPL

http://udhcp.busybox.net/downloads/

wtools:

wireless_tools.26
GPL

http://pcmcia-cs.sourceforge.net/ftp/contrib/

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* README file for STLport 4.5 *

* *

*

This directory contains STLport-4.5 release. What's inside :

README - this file

INSTALL - installation instructions

stlport - main STLport include directory

src - source and makefiles for iostreams implementation

lib - installation directory for STLport library (if you use STLport

iostreams only)

test/regression - regression test, using wrapper iostreams

test/eh - exception handling test using STLport iostreams

etc - miscellanous files (ChangeLog, TODO, scripts, etc.)

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